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BENGAL IN MAPS

A GEOGRAPHICAL ANALYSIS OF RESOURCE DISTRIBUTION
IN WEST BENGAL AND EASTERN PAKISTAN

By

S. P. CHATTERJEE, M.Sc., Ph.D., (LONDON), D.LITT., (PARIS)

Head of the Department of Geography, University of Calcutta

FOREWORD BY

THE HON'BLE

DR. SYAMA PRASAD MOOKERJEE

Minister for Industry and Supply, Government of India.

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FOREWORD

Dr. S. P. Chatterjee's "Bengal in Maps" is something more than an Atlas of the conventional type : it provides a fairly complete socio-economic picture of contemporary Bengal. I have been acquainted with Dr. Chatterjee's work for a number of years. His cartographical representations of Bengal depicting the topography, vital statistics and other social and economic data, are in many respects remarkable for their scientific accuracy and meticulous detail and break new ground in our country. In other countries, vast sums have been spent in compiling specialised and detailed maps, embodying environmental and socio-economic information, which give us a vivid grasp and mastery of data, such as no mere statistical handbook can possibly convey. Its importance, specially in relation to national planning and reconstruction cannot be over-emphasised. The Great Soviet World Atlas is the most comprehensive of all atlases so far produced in the world. The compilation of the maps for the Atlas alone cost the Soviet Government some three million roubles ; and it was made obligatory for scientific workers and institutions in the country to assist in the compilation of this work. In our country, we have no Atlas even remotely approaching the Soviet effort in scientific detail and comprehensiveness. Nevertheless, what Dr. Chatterjee and his co-workers have produced with negligible resources at their command, deserves every praise.

I hope such efforts on his part and on the part of others elsewhere in India will receive support and encouragement at the hands of the State and will be properly co-ordinated with its plans for social and economic reconstruction.

New Delhi,
March 14, 1949.

Syam Hoax Roxy

PREFACE

This atlas is not a collection of locational maps of the conventional type. It contains a number of specialized maps, based on field and library work, carried out by the author for a number of years with the financial assistance of the University of Calcutta. The observations and statistics were then plotted on large scale maps, mainly for the purpose of teaching the geography of Bengal to University post-graduate students. Some of the maps were subsequently exhibited in a geographical exhibition, opened in Calcutta by Professor E. Dudley Stamp of London University in January, 1947. It was then suggested that the maps be printed in the form of an atlas, and the revision of the maps from the production point of view was taken up soon after. In the meantime came the movement for the partition of Bengal, when the intelligentsia of India in general and Bengal in particular, became almost overnight map conscious, and maps of every kind were in great demand. A special map was prepared in the Department of Geography of Calcutta University under the direction of the author, indicating the probable boundary line between West and East Bengal, if Bengal were to be partitioned. The publication of that map aroused further interest in cartographical representations, and it was then felt, and rightly so, that a set of maps depicting the entire field of the geography of Bengal might put the members of the Bengal Boundary Commission on the right track. Had the maps been in print before the final award of Sir Cyril Radcliffe, there would perhaps have been a more reasonable partition of Bengal to the satisfaction of the two major communities of the province, Hindus and Muslims. Most of the maps, as presented in the atlas, have the Radcliffe line marked on them, which can be seen to run across important roads and railways, thereby disrupting the existing transport systems and breaking up areas of regional unity.

It is hoped that some of the maps, incorporated in the atlas, may be of use in connection with planning of national development, rehabilitation and reconstruction. In any case, the distributional patterns displayed by the maps will be of interest to statisticians and economists. The atlas may serve another useful purpose. Since it is a sort of 'stock taking' of the national resources of the province at the time the British withdrew from India, and Bengal was partitioned, it may have some value as a historical document in map form for the comparison of the future economy of both West Bengal and Eastern Pakistan (East Bengal) with their past common tradition. The sources of information are noted in the text accompanying the maps. The agricultural maps, though primarily based on the statistics collected and published recently by the Agricultural Department of Bengal, are revised in the light of the findings of the land utilisation survey work carried out by the author in certain districts of Bengal. Agricultural statistics relating to the Sylhet district, which now forms part of Eastern Pakistan, could not be secured, hence the old name 'East Bengal' has been retained in the text.

The author is well aware of the deficiencies in the atlas. It hardly approaches any of the recently published standard European regional atlases in comprehensiveness or fine lithographic technique. For lack of co-operation, historical facts and other valuable statistics could not be secured in time to turn them into maps. For reasons of economy, the maps could not be printed on larger scales or in colours. The 'dot method' is extensively used, being the simplest, quickest and least expensive from the production standpoint. It is true that all the maps could not be drawn originally on the same scale, but the distributions have, however, been shown, as far as possible, on the same base map (Map 3), for facilitating comparison.

The author gratefully acknowledges his indebtedness to the University of Calcutta for providing all facilities in connection with the preparation of the atlas, and to Professor P. N. Banerjee, the present Vice-Chancellor of the University, on whose recommendation the University sanctioned

a generous sum for the subscription of no less than 500 copies. To the learned Vice-Chancellor therefore, this work owes its existence. The author is also deeply grateful to the Hon'ble Dr. Bidhan Chandra Roy, former Vice-Chancellor of the University and now the Prime Minister of West Bengal, at whose instance, the Government of West Bengal have sanctioned the purchase of 250 copies for official use. To the Hon'ble Dr. Swami Prasad Mookerjee, former Vice-Chancellor of the Calcutta University and now Minister for Industry and Supply, Government of India, a great debt is due not only for writing the Foreword, but also for helping the author in many ways. It was mainly through his efforts that the Department of Geography was established in Calcutta University without which it would not have been possible for the author to make his humble contributions in the cause of geography. The author offers his sincere thanks to Mr. A. K. Chanda, M.A. (Oxon), Additional Secretary, Department of Education, Government of West Bengal, for his warm sympathy and encouragement. Thanks are also offered to those who assisted him in the preparation of the atlas, especially to Mr. H. Das of Messrs. Eagle Lithographing Company for his valuable suggestions and for printing and supplying the base map free of cost; and to the draughtsmen of the Department of Geography, especially to Sri Anil Kumar Dutta, for the great pains they took in executing the work and to Sri Santosh Kumar Roy, B. Com., for volunteering secretarial work. Thanks are also offered to the author's former students, who are now teaching geography either in the University of Calcutta, or in one of its constituent colleges, especially to Sri Birendra Nath Ganguli, M.A. for his general supervision, to Sri Sujan Bandhab Chatterjee, M.Sc. for his assistance in the preparation of the climatological maps, and to Sri Siva Prasad Dasgupta, M.Sc. for his help in the drawing of the industrial maps. In the end, the author tenders his sincere thanks to the publishers, Messrs. Orient Longmans, for many courtesies.

Department of Geography
Calcutta University
Senate House
July, 1948.

S. P. CHATTERJEE

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BENGAL IN MAPS

DIVIDED BENGAL IN DIVIDED INDIA

MAP 1

The map shows the geographical position of Bengal against the present political set-up of India. With the separation of Burma from India in 1937 Bengal lost its central position in Eastern India. India's mastery over the Bay of Bengal remained unchallenged, until a new State was carved out as a result of the Radcliffe Award, and the achievement of independence by Burma in 1948. The Bay of Bengal is now shared between the Indian Union, Pakistan and the Union of Burma. The position of Calcutta as a focus of airways on the eastern frontier of India between Eastern Pakistan and the Union of Burma on one hand and the Indian Union on the other, has also been brought out on the map. With the economic and political assertion of India, Pakistan, Burma and other Asian countries the position of Calcutta on the air map of this part of the world will be strategically more important. The map also shows the new frontier lines in relation to India and Pakistan. The north-western frontier has been moved from a more easily defensible line of hills to the flat plains of the Punjab. The easternmost frontier of India, though conforming to the old boundary line between Assam and Burma has somewhat lost its strategic value on account of the wedge-like location of the newly formed Eastern Pakistan (the province of East Bengal) between the frontier province of Assam and the rest of India. Hence the Indian Union has three frontier lines on the east.

The map also shows that the present political map of India contains a number of new names, as a result of the policy of the free India in relation to Indian States. Some of the smaller States, which were situated within an Indian province, merged into the province. Others, which could form themselves into a compact union, for their own interest, did so. Three different processes have been recently introduced by the Government of India in relation to the integration of States, each being applied according to size, geography, and other factors, relating to each State or group of States. According to the White Paper on Indian States published by the Government of India (July, 1948), 535 States covering an area of about 254,235 square miles and with a population of over 37 millions, either merged with the adjacent province, or the centre, or have combined to form new States. Of these, 219 States with an area of 84,774 square miles, a population of 120·18 lakhs, and

a revenue of Rs. 541·84 lakhs have merged in the adjacent provinces; 22 States consolidated into two centrally-administered areas—Himachal Pradesh and Kutch, with an area of 19,061 square miles, a population of 14·37 lakhs and a revenue of about Rs. 165 lakhs; 294 States integrated to create six viable units—Saurashtra, Matsya, Vindhya Pradesh, Rajasthan, Madhya Bharat, Patiala and East Punjab States Union, covering an area of 150,400 square miles with a population of 237·61 lakhs and a revenue of Rs. 2,819·45 lakhs. The two Bengal States—Cooch Behar and Tripura, have not yet been affected by any merger or integration scheme. The following statement is extracted from the White Paper.

1. MERGERS WITH THE ADJACENT PROVINCES

*Province with which merged,
and the area and population
of States thus merged.*

States

ORISSA

Area—23,637 square miles.
Population—40·46 lakhs.

Athgarh, Athmalik, Bamra, Baramba, Baudh, Bonai, Daspalla, Dhenkanal, Gangpur, Hindol, Kalahandi, Keonjhar, Khandpara, Narsingpur, Nayagarh, Nilgiri, Pal-Lahara, Patna, Rairakhol, Raipur, Sonepur, Talcher, Tigiria.

BIHAR

Area—623 square miles.
Population—2·08 lakhs.

Seraikela, Kharsawan.

CENTRAL PROVINCES AND BERAR

Area—31,749 square miles.
Population—28·34 lakhs.

Bastar, Changbhakar, Chhuiukhadan, Jashpur, Kanker, Kawardha, Khairagarh, Korega, Nandgaon, Raigarh, Sakti, Sarangarh, Surguja, Udaipur, Makrai.

EAST PUNJAB

Area—370 square miles.
Population—0·81 lakhs.

Loharu, Dujana, Pataudi.

MADRAS

Area—1,444 square miles.
Population—4·83 lakhs.

Banganapalle, Padukkottai.

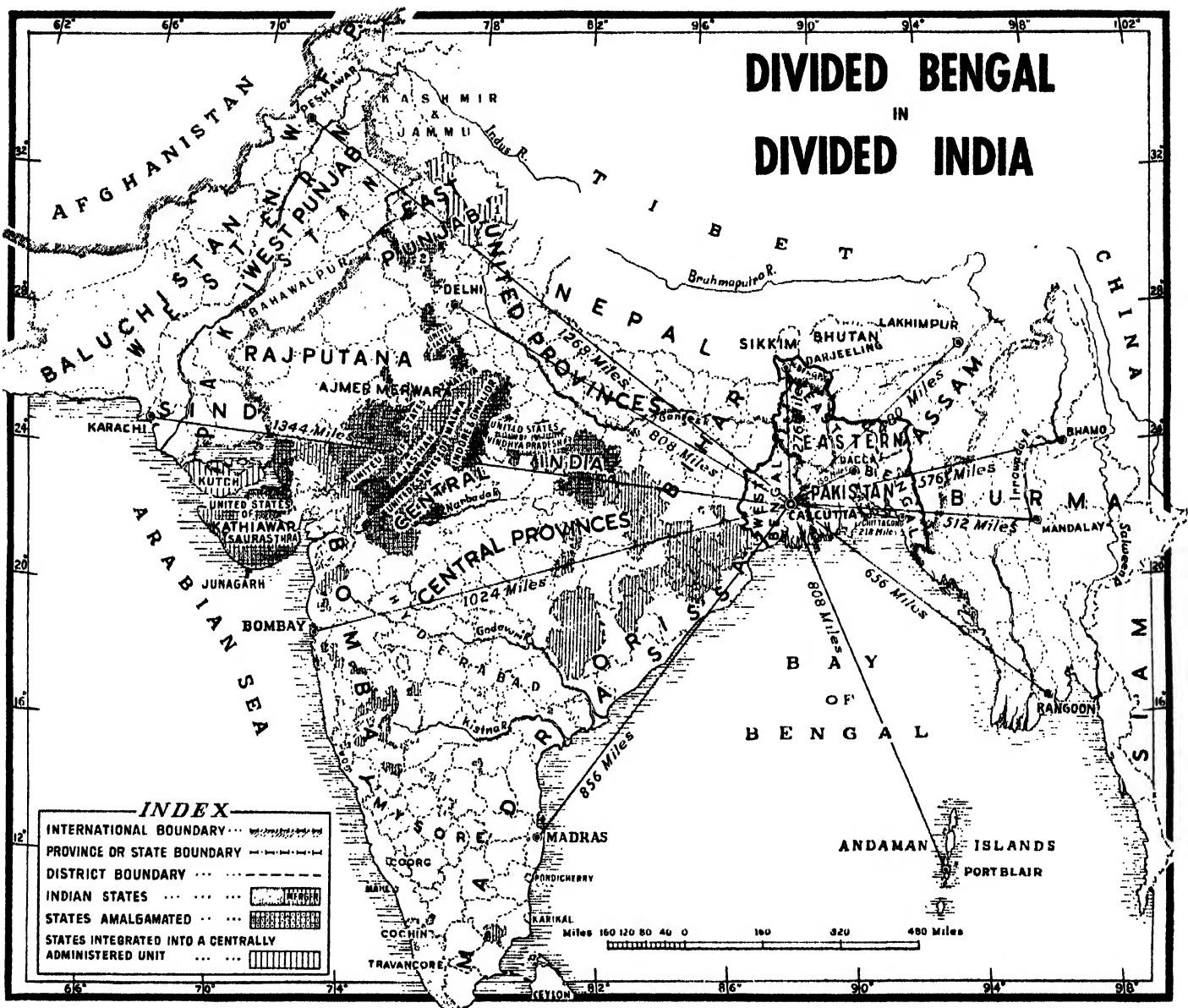
BOMBAY

Area—26,951 square miles.
Population—44·02 lakhs.
[174 States involved]

Akkalot, Aundh, Bhor, Jamkhandi, Jath, Kurundwad (Senior and Junior), Miraj (Senior and Junior), Mudhol, Randurg, Sangli, Savanur, Sawantwadi, Wadi, Jaghir, Janjira, Phaltan, Balasinor, Bansda, Baria, Cambay, Chhota-Udepur, Dharampur, Jawhar, Lunawada, Rajpipla, Sachin, Surgana, Sant, Idar, Vijaynagar, Danta, Palanpur, Jumbughoda, Sirohi; and the semi-jurisdictional and non-jurisdictional thanas, estates, and taluks of Gujarat.

(Continued on page 4)

Map 1



1. HIMACHAL PRADESH
2. PATIALA AND EAST PUNJAB STATES

GREATER BENGAL

MAP 2

This map shows the extent of Greater Bengal, based on the language spoken by the vast majority of the people. Bengali is the mother tongue of 923 in every 1,000 inhabitants of Bengal, and if it be assumed that persons born elsewhere than in Bengal speak other languages than Bengali, 955 in every 1,000 of the population born in Bengal use Bengali as their mother-tongue. Bengal may be politically divided to-day, but this community of language will continue to be the most powerful unifying factor of Greater Bengal. From the percentage figures on the map, one can see that almost one hundred per cent of the people of East Bengal have Bengali as their mother tongue, and this percentage is somewhat less in West Bengal. In East Bengal it is only in the Chittagong Hill Tracts that languages other than Bengali are spoken by the majority of the population. Such is the case with the State of Tripura. In West Bengal, Tibeto-Burma dialects and Nepali are also spoken in Darjeeling district, Maghi in parts of Malda, and Oriya in the south-west of Midnapur district.

Outside the limits of both West and East Bengal the areas where the Bengali language is spoken by the majority of the people have been roughly indicated on the map, based on the following observations of Sir

George Grierson in the Linguistic Survey of India Vol. V, Part I, p. 12:—

"The Bengali language also extends on the west into Chota-Nagpur, being spoken in the eastern portions of that division, below the plateau of Hazaribagh and Lohardaga. Its western boundary runs through the district of Singhbhum, and includes the whole of the district of Manbhumi. It then meets the hilly country of the Santal Parganas in which languages belonging to the alien Munda family are spoken, and is forced in a north-easterly direction up to the river Ganges which it crosses near Rajmahal. Thence it runs nearly due north following closely the course of the Mahananda river, through the districts of Malda and Purnea up to the Nepal frontier. On the east it extends into the Assam valley where it gradually merges into the cognate Assamese language. It also occupies the Assam districts of Sylhet and Cachar."

The map also shows the main communication systems in and around Greater Bengal. The trunk roads and trans-Indian railroads have made West Bengal easily accessible to the rest of the Indian Union. The wide rivers of East Bengal, though they serve as highways for water-borne traffic, present real hindrances to other kinds of traffic.

(Continued from Page 2)

2. CENTRALLY-ADMINISTERED STATES

New States

HIMACHAL PRADESH
Area—10,600 square miles.
Population—9·36 lakhs.

Old States

The Punjab Hill States of Baghal, Baghat, Balsan, Bashahr, Bhajji, Bija, Darkoti, Dhami, Jubbal, Keonthal, Kumarsain, Kunihar, Kuthar, Mahlog, Sangri, Mangal, Sirnur, Tharoch, Chamba, Mandi, Suket.

KUTCH

Area—8,461 square miles.
Population—5·01 lakhs.

Kutch.

New Union

SAURASHTRA

Area—31,885 square miles.
Population—35·22 lakhs.
[217 States involved]

3. UNION OF STATES

Old States

449 units including the 30 jurisdictional States of Nawanagar, Bhavnagar, Porbandar, Dhrangadhra, Morvi, Gondal, Jafrabad, Rajkot, Wankauer, Palitana, Dholrol, Chuda, Limbdi, Wadliwan, Lakhtar, Sayla, Vala, Jasdan, Amarnagar, (Thandevli), Vadia, Lathi, Muli, Bajana, Virpur, Maliya, Kotda-Sangani, Jetpur, Bilkha, Patdi, Khirasra.

THE UNITED STATE

OF MATSYA

Area—7,536 square miles.
Population—18·38 lakhs.

Alwar, Bharatpur, Dholpur, Karauli

THE UNITED STATE

OF VINDHYA

PRADESH

Area—24,610 square miles.
Population—35·69 lakhs.

Ajaigarh, Baoni, Baraundha, Bijawar, Chhatarpur, Charkhari, Datia, Maihar, Nagod, Orchha, Panna, Rewa, Samthar, Alipur, Banka-Pahari, Beri, Bhaisaundha, Bibat, Bijnor, Dhurwai, Gaurihar, Garrauli, Jaso, Jigni, Kanpara, Rajauli, Khaniadhana, Kothi, Lugasi, Naigawan-Robai, Pahra, Paldeo (Nayaagon), Sarila, Sohawal, Taraon, Tori-Fatehpur.

Banswara, Bundi, Dungarpur, Jhalawar, Kishengarh, Kotah, Partabgarh, Shahpura, Tonk, Udaipur.

THE UNITED STATE

OF RAJASTHAN

Area—29,977 square miles.
Population—42·61 lakhs.

Alirajpur, Barwani, Dewas (Senior and Junior), Dhar, Gwalior, Indore, Jaora, Jhabua, Khilchipur, Narsingarh, Rajgarh, Ratlam, Sailana, Sitamar, Jobat, Kathiawara, Kurwai, Mathwar, Piplodha.

MADHYA BHARAT

(GWALIOR-INDORE-MALWA UNION)

Area—46,273 square miles.
Population—71·50 lakhs.

Amarnagar, (Thandevli), Vadia, Lathi, Muli, Bajana, Virpur, Maliya, Kotda-Sangani, Jetpur, Bilkha, Patdi, Khirasra.

PATIALA AND EAST

PUNJAB STATES

UNION

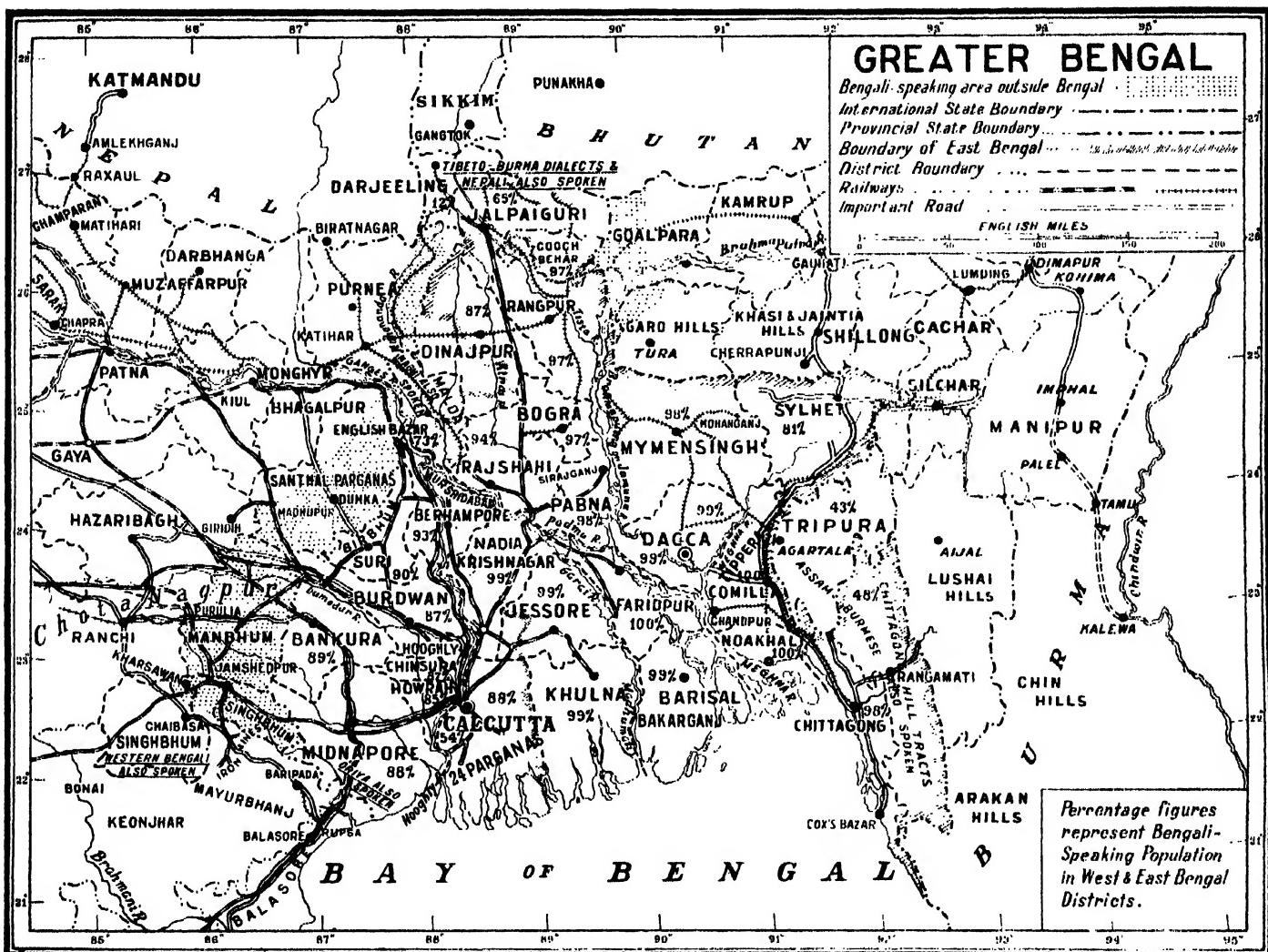
Area—10,119 square miles.
Population—34·24 lakhs.

Patiala, Kapurthala, Nabha, Jind,

Faridkot, Malerkotla, Nalagarh,

Kalsia,

Map 2



WEST AND EAST BENGAL

MAP 8

This map shows the administrative divisions as they existed in undivided Bengal. Since the partition there have been few changes, most of the police stations, (that is, thanas), retaining their old boundaries. The western and northern parts of the undivided Bengal now form the West Bengal province, and the rest of Bengal including the greater part of Sylhet district constitutes the new province of Eastern Pakistan. The Radcliffe line as shown on the map, separating the two newly constituted provinces, follows mainly the thana boundaries, except in two thanas, Balurghat (marked 27 on this map) in Dinajpur district and Daulatpur (marked 1 on the map) in Nadia district. As a result of the partition the following changes have been made in West and East Bengal. (1) The portion of Dinajpur district lying in West Bengal has been named West Dinajpur with its headquarters at Balurghat. (2) The portion of Nadia district lying in East Bengal has been named Kushtia district with its district headquarters at Kushtia. (3) In Balurghat thana the main railway line including the Hilly railway station and the portion lying east of the line (1,923 acres approximately) has been included in East Bengal. (4) In Daulatpur thana, in Nadia district the original off-take of the Matabhanga including the portion lying west of the river (11,200 acres approximately) has been included in West Bengal.

RADCLIFFE LINE BETWEEN WEST AND EAST BENGAL

The text of the Radcliffe Award is as follows:

"(1) A line shall be drawn along the boundary between the thana of Phansidewa in the district of Darjeeling and the thana Tetulia in the district of Jalpaiguri from the point where that boundary meets the province of Bihar and then along the boundary between the thanas of Tetulia and Raiganj; the thanas of Pachagar and Raiganj; the thanas of Pachagar and Jalpaiguri, and shall then continue along the northern corner of the thana Debiganj to the boundary of the State of Cooch Behar. The district of Darjeeling and so much of the district of Jalpaiguri as lies north of this line shall belong to West Bengal, but the thana of Patgram and any other portion of Jalpaiguri district which lies to the east or south shall belong to East Bengal.

"(2) A line shall then be drawn from the point where the boundary between the thanas of Haripur and

Raiganj in the district of Dinajpur meets the border of the province of Bihar to the point where the boundary between the districts of 24-Parganas and Khulna meets the Bay of Bengal. This line shall follow the course indicated in the following paragraphs. So much of the province of Bengal as lies to the west of it shall belong to West Bengal.

"Subject to what has been provided in paragraph 1 above with regard to the districts of Darjeeling and Jalpaiguri, the remainder of the province of Bengal shall belong to East Bengal.

"(3) The line shall run along the boundary between the following thanas:

Haripur and Raiganj, Haripur and Hemtabad, Ransankail and Hemtabad, Pirganj and Hemtabad, Pirganj and Kaliaganj, Bochaganj and Kaliaganj, Biral and Kaliaganj, Biral and Kushmundi, Biral and Gangarampur, Dinajpur and Gangarampur, Dinajpur and Kunarganj, Chirir Bandar and Kunarganj, Phulbari and Kunarganj, Phulbari and Balurghat. It shall terminate at the point where the boundary between Phulbari and Balurghat meets the north-south line of the Bengal-Assam Railway in the eastern corner of the thana of Balurghat. The line shall turn down the western edge of the Railway lands belonging to that railway and follow that edge until it meets the boundary between the thanas of Balurghat and Panchbibi.

"(4) From that point the line shall run along the boundary between the following thanas:

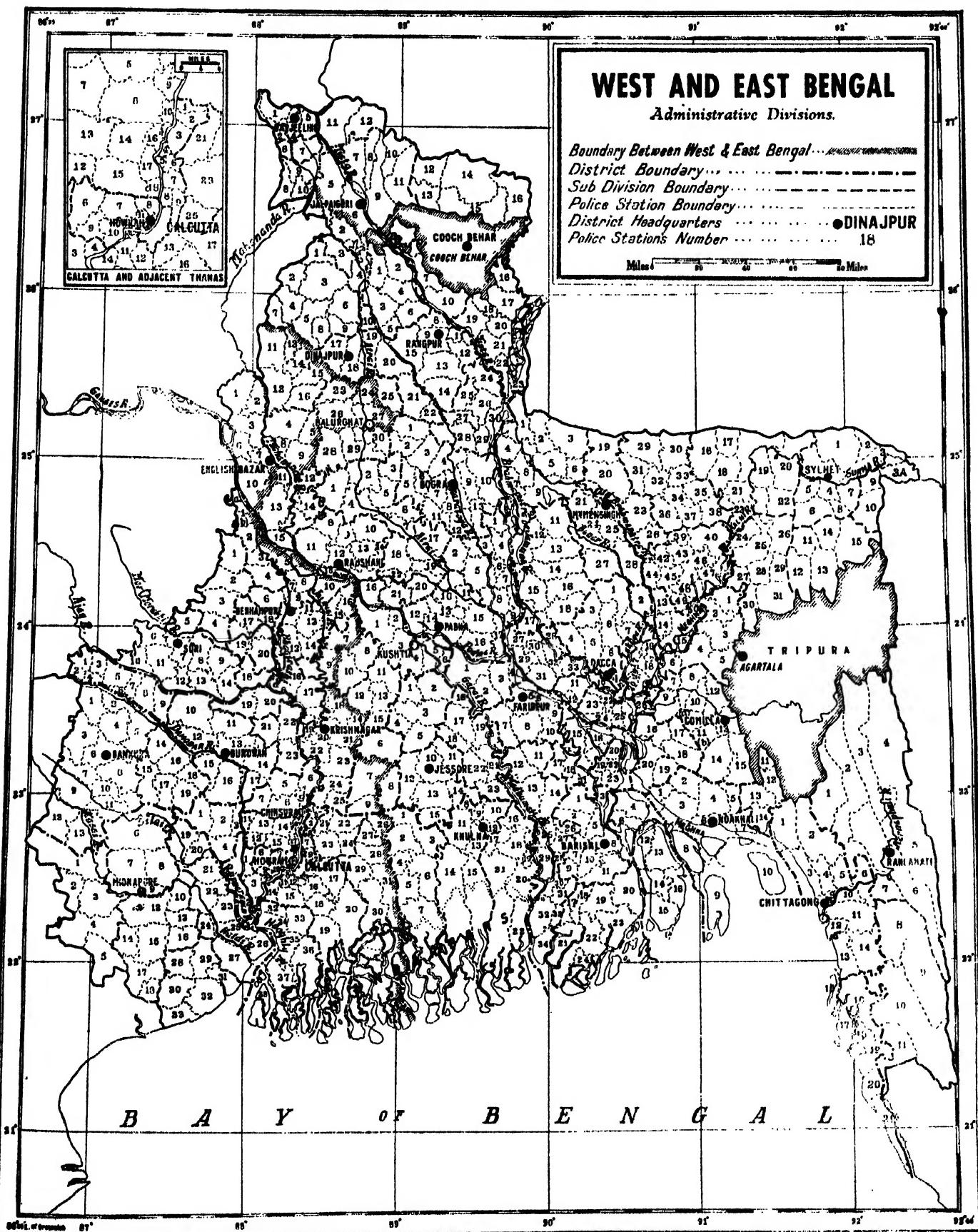
Balurghat and Panchbibi, Balurghat and Joypurhat, Balurghat and Dhamairhat, Tapan and Dhamairhat, Tapan and Patnitala, Tapan and Porsha, Bamangola and Porsha, Habibpur and Porsha, Habibpur and Gomastapur, Habibpur and Bholahat, Malda and Bholahat, English Bazar and Bholahat, English Bazar and Shibganj, Kaliachak and Shibganj, to the point where the boundary between the two last mentioned thanas meets the boundary between the districts of Malda and Murshidabad on the river Ganges.

"(5) The line shall then turn south-east down the river Ganges along the boundary between the districts of Malda and Murshidabad; Rajshahi and Murshidabad, Rajshahi and Nadia, to the point in the north-western corner of the district of Nadia where the channel of the river Matabhanga takes off from the river Ganges, shall

(Continued on page 11)

(For the names of the police-stations, corresponding to the numbers shown on the map, see the Appendix)

Map 3



RELIEF AND RIVERS

MAP 4

THE RELIEF

The essential geographic feature of Bengal is the almost total absence of relief, and this becomes more striking when one sees the highest mountain system in the world, the Himalaya with its majestic peaks Mt. Everest (29,010 feet) and Kanchenjunga (28,116 feet) overlooking it in the north, and extremely dissected plateaus and hills rising abruptly from the plains in the north-east and east. It is only in the west that the topographic break is least pronounced, the plains merging almost imperceptibly into a slowly rising plateau. The plains, however, extend beyond the limits of Bengal through wide gaps. The plains of Bengal, though characteristically flat, have been unequally aggraded, with the result that some lie above flood-level, and others remain below the water-table. This difference in level exerts considerable influence on agriculture. For example, in the northern part of Tippera district there is paddy growing on land of one level or another all the year round. The plains can be broadly grouped into three classes : the older deltaic and flood plains lying north of the Ganges-Padma-Meghna axis, the younger deltaic and flood plains lying south of the axis, and the erosional and flood plains lying west of the Bhagirathi-Hooghly river. The trends of the contour lines and river courses indicate that the general slope of each of these three groups of plains is in a different direction, south-east, south and east respectively.

The surfaces of the older delta have been partially preserved in the Barind, Madhupur and Lalmai hills. These were upraised and subsequently dissected by the rejuvenated rivers. There is evidence to suggest that at least some portion of the older delta is still rising (Lalmai hills). The broad swells of this delta both in the Barind and Madhupur plains, which are not discernible in the map, are interpreted as natural levees of the former distributaries. The younger delta is in many respects typical. It is a combination of flood and deltaic plains. It is extremely low-lying and has a web of distributaries, especially in the south. If the sea were to rise some 25 feet its greater part including the city of Calcutta would become submerged under water. The surface is studded by a number of depressions, locally known as bils, which are covered by salt water (as in the tidal Salt Lakes near Calcutta) or by fresh water (as in the Madaripur bil).

The map also shows that the delta face has not advanced sufficiently in the east, at least not to the same extent as in the west, despite the fact that the bulk of silt-laden river waters enter the sea there.

There are two explanations for this. One is that the two tidal waves in the Bay coming from the west and east are exceptionally strong and carry a large part of the suspended river silts, which get deposited where these two waves meet nearer the western face of the delta. The tidal bores which are stronger in the west, as indicated by the one-foot tidal contour, carry some of the suspended material far inland and deposit it partly on the bed of the estuaries and partly in adjacent flood basins, raising their levels. Secondly, the main channels of the Ganges were until recently in the west, and hence the delta-building movement must have been more active there in the past than at present. It has also been pointed out that there has been very little indeed by way of extension of the delta face seaward in the last two centuries. The Ganges delta is unique in this respect. This static nature of the delta may be ascribed to the exceptional depth of the continental shelf bordering the coast, which is being at present filled up by the river sediments. One of the submarine canyons has been shown on the map. It may be that there were many others, which got filled up by the river-silts. The plains lying west of the Bhagirathi river have a different life history. This part of Bengal is definitely older, and the general slope of the land is somewhat steeper. There are a number of terraces extending from north to south. These flats grade into mild undulations, and wherever harder rocks like granites or gneisses or quartzites come to the surface, they have been dissected into hills or ridges. The most conspicuous hills are found in the south-west of Bankura district and north-west of Midnapur district, which rise to a height of over 1,000 feet and have been considerably dissected. The Shusunia hill and the Biharinath Parbat in Bankura district appear as monadnocks, and dominate the landscape.

There is another type of plain lying at the foot of the Himalaya. This is the typical piedmont plain of the Terai and Western Duars. It is porous and well drained, and is the ideal home of tea plantations, wherever soils have been developed and irrigation facilities have been provided.

Behind the Terai plain rise several ranges of the

Map 4

RELIEF AND RIVERS

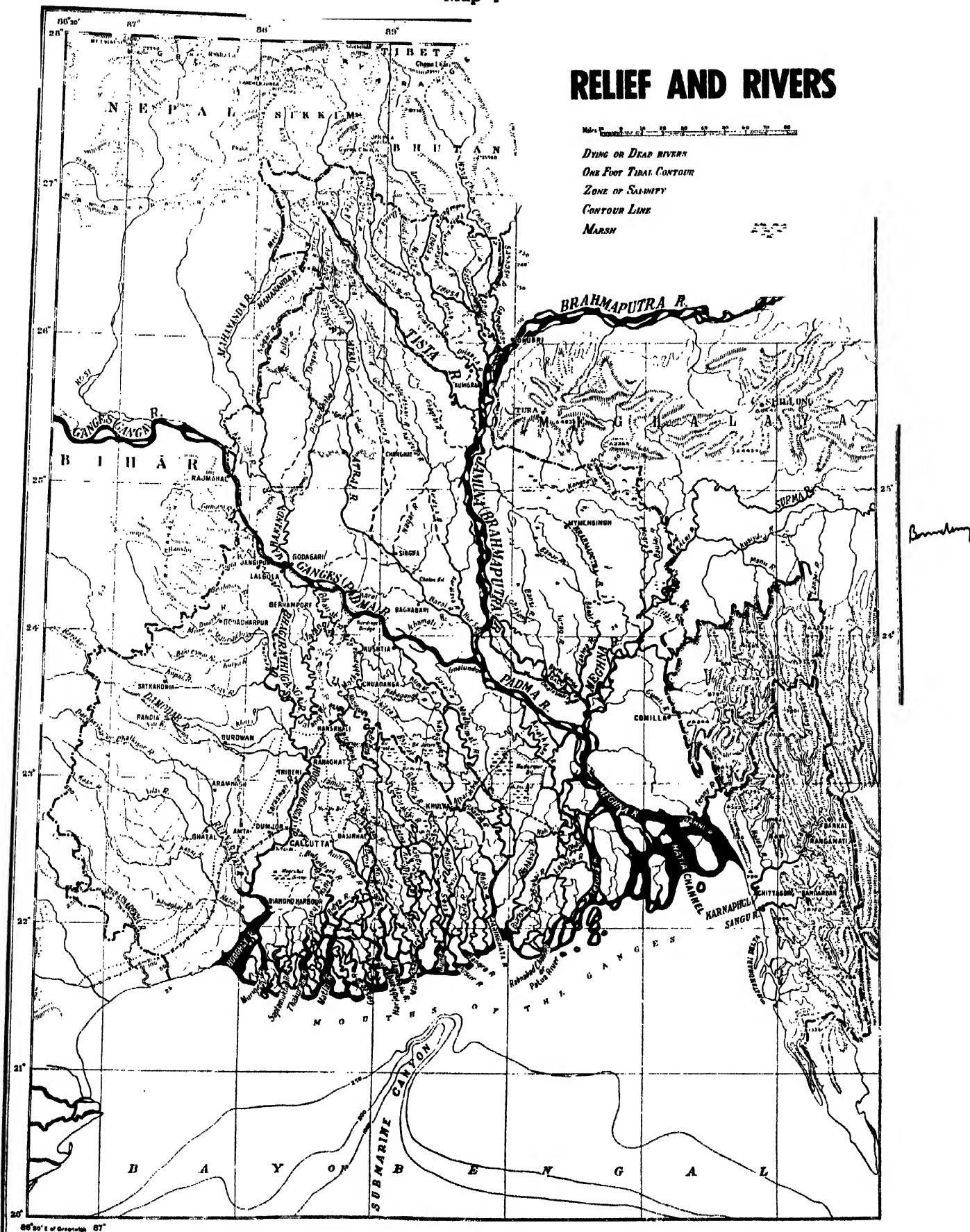
Male & Female 10 20 30 40 50 60 70 80

DRYING OR DEAD RIVERS

ONE FOOT THAI CON

Zone or Series

CONTOUR



Himalaya to the stupendous heights of over 10,000 feet in Darjeeling district. The ranges have been considerably dissected by powerful streams and excessive rains, and consist of a number of erosional surfaces at different levels, with a wide range of climate.

The hills in the Tripura and Chittagong Hill Tracts run from north to south, intervened by valleys with an average width of 10 miles. They increase in height towards the east.

THE RIVERS

The principal rivers of Bengal are of allogene type in the sense that they have their sources in distant hills and mountains where they are fed partly by the melting of snows and partly by rains. They flow for hundreds of miles before entering the vast plains of Bengal, which stretch in all directions, and lie almost at the base level of erosion. The Ganges (Ganga), the Brahmaputra and the Meghna, the three largest river systems of India, merge together in the plains of Bengal, before entering the sea. All these have large flows in the wet summer season and periods of low water before the rains set in. For example, the discharge of the Ganges near the Hardinge bridge fluctuated from 4,99,835 (as observed on 9th June) to 15,13,423 cusecs (as observed on 29th August) in a particular year (1942) for which records are available. These three rivers receive between them the waters of all the other streams, except the Subarnarekha in the west, and the Karnaphuli and a few others flowing south of it, in the east, and go on distributing their waters through a large number of channels on their seaward march. Of the three, the Ganges is by far the most important. South and also north of its present principal channel, locally known as the Padma, its waters flow, at least part of the year, through a number of distributaries. The Bhagirathi (Ganga) is its westernmost and was at one time its principal channel, the lower reach of which was named the Hooghly by English sailors in the seventeenth century. This river is of vital importance not only to the present province of West Bengal, but also to the whole of Northern India, as on its banks stands Calcutta, the largest port of India. From the dry weather flow of the river it is evident that it is dying in its upper reach and that the conditions of its left-bank feeders, the Bhairab-Jalangi and Matabhanga are no better. (The average flow for seven months, December to June : Bhagirathi at Jangipur, 61 cusecs ; Bhairab-Jalangi at Muktearpur, 100 cusecs ; the Matabhanga at Chuadanga, 350 cusecs). It has been suggested that a barrage, if built across the Ganges somewhere between Godagari and Lalgola, will help in the resuscitation of the Bhagirathi. Besides the

Matabhanga, the Ichamati-Raimangal flows near the present boundary between West and East Bengal. It is a perennial river, with a flow of over 30,000 cusecs at Basirhat. East of the present boundary the only river that carries sufficient quantity of Ganges water is the Garai-Madhumati-Haringhata (58,976 cusecs at Tona). Further east lies the Arial Khan (1,36,272 cusecs) which was the main channel of the Ganges before it turned east to join the Meghna. There are a number of estuaries, each resembling an arm of the sea, between the mouths of the Hooghly and the Meghna. West of the Haringhata these are kept open by tidal waters and local rains. The right bank tributaries of the Bhagirathi and Hooghly belong to a different river regime. They run more or less from west to east, each independent of the other, through wide alluvium-filled troughs. They are mere trickles in the greater part of the year, but with the advent of the monsoonal rains they become unfordable, and are often subject to violent and destructive floods. The Damodar is the typical example of this type of river, the preliminaries for the training of which, as outlined in the Damodar Valley Project, have just been completed. The flow of this river in high water and low water months was reported as follows : March, 125 cusecs ; September, 96,936 cusecs. The Ajay which lies further north, becomes completely dry in May and discharges over 12,000 cusecs of water in August.

The North Bengal plains are bordered on the east by the Brahmaputra (Jamuna) and on the south by the Ganges (Padma), and across them flow the Tista, Mahananda and many other streams. Before 1787 the Tista used to flow into the Ganges through the Atrai channel, and its waters were also distributed through the Karatoya and Punarbhaba. Since its diversion most of the rivers of Northern Bengal have been deprived of their headwater and are now dying. The Mahananda is the only exception, but even this river shows a tendency to leave its present bed through Bengal, and take to newer westerly channels. The present Tista and all the other rivers which flow east of it, the Jaldhaka-Dharla, Torsa-Raidak and Sankosh-Gangadhar, belong to the same regime. They are all Himalayan rivers, and their levels rise all of a sudden even 2 to 3 feet in a day and subside quickly without appreciable damage to crops resulting from this submersion.

The Brahmaputra perhaps carries more water than the Ganges, the maximum discharge being some 2,000,000 cusecs. Its present course runs much to the west of its former channel, which still flows past Mymensingh town and carries some Brahmaputra water, especially in the wet summer season.

The Dhaleswari, Burhiganga and Lakhya are the other

important perennial streams which flow in between the Jamuna and Meghna. The winter discharges of flow of the first two are considerably lower than that of the Lakhya. (In February—the Dhaleswari discharges 9,436, the Burhiganga 9,696 and the Lakhya 20,609 cusecs). Their discharges in the monsoonal months are higher. (In September—the Dhaleswari, 1,51,508 ; the Burhiganga, 1,08,365 : and the Lakhya 93,565 cusecs). Thus the Lakhya is the more steady river and has on its banks some growing industrial centres like Narayanganj.

Unlike the Ganges and Brahmaputra the Meghna is fed entirely by rain water. The excessive rains on the

southern slopes of the Meghalaya and in the Eastern Hills and Surma Valley find their way into the channel of the Meghna and make it a formidable river. The presence of a number of large alluvial lakes, locally known as haors, along the course of the Meghna tends to make the flow more uniform than that of the Ganges or Brahmaputra.

East of the Meghna the only river of importance is the Karnaphuli, the mouth of which provides the maritime outlet of East Bengal, and whose upper reaches favour the installation of hydro-electric plants.

WEST AND EAST BENGAL

(Continued from page 6)

constitute the boundary between East and West Bengal." "From the point of the river Ganges where the channel of the river Matabhanga takes off the line shall run along that channel to the northernmost point where it meets the boundary between the thanas Daulatpur and Karimpur. The middle line of the main channel shall constitute the actual boundary.

"From this standpoint the boundary between East and West Bengal shall run along the boundaries between the thanas Daulatpur and Karimpur, Gangani and Karimpur, Meherpur and Tehatta, Meherpur and Chapra, Damurhuda and Chapra, Damurhuda and Krishnaganj, Chuadanga and Krishnaganj, Jibannagar and Krishnaganj, Jibannagar and Hanskhali, Maheshpur and Ranaghat, Maheshpur and Bongaon, Jhikargacha and Bongaon, Sarsa and Gaighata, Gaighata and Kalaroa to the point where the boundary between these thanas meets the boundary between the districts of Khulna and 24-Parganas.

"The line shall then run south along the boundary between the districts of Khulna and 24-Parganas to the point where the boundary meets Bay of Bengal."

RADCLIFFE LINE BETWEEN EAST BENGAL AND ASSAM

"A line shall be drawn from the point where the boundary between the thanas of Patharkandi and Kulaura meets the frontier of Tripura State and shall run north along the boundary between the thanas of Karimganj and Barlekha, and then along the boundary between the thanas of Karimganj and Beani Bazar to the point where that boundary meets the river Kusiyara. The line shall then run to the east taking the river Kusiyara as the boundary and run to the point where that river meets the boundary between the districts of Sylhet and Cachar. The centre line of main stream or channel shall constitute the boundary. So much of the district of Sylhet as lies to the west and north of this line shall be detached from the province of Assam and transferred to the province of East Bengal."

[The boundary line between West and East Bengal in Daulatpur thana, Kushtia district (marked I on the map) should not coincide with the thana boundary, as shown on the map. It should run a little east of the western boundary of the thana, along the original off-take of the Matabhanga].

RIVERS OF THE EIGHTEENTH CENTURY

MAP 5

Major James Rennell carried out an intensive survey of the river systems of Bengal between 1765 and 1773, and prepared a series of maps. This map is based on those sheets. Since Rennell's time the rivers of Bengal have deteriorated and have changed their courses considerably. Rennell's remarks on the rivers of Bengal are no longer true. He wrote "The Ganges and Brahmaputra rivers, together with their numerous branches and adjuncts, intersect the country of Bengal in such a variety of directions as to form the most complete and easy navigation that can be conceived. So equally and admirably diffused are those natural canals, over a country that approaches nearly to a perfect plane, that after excepting the lands contiguous to Burdwan, Birbhum etc., which may be reckoned a sixth part of Bengal, we may safely pronounce that every other part of the country, has even in the dry season, some navigable stream within 25 miles at farthest and more commonly within a third part of that distance."

Unlike their present courses, the Ganges and Meghna then flowed through independent channels until they joined near the coast a little north of Dakhin Shabazpur island. The main channel of the Brahmaputra, far to the east, later dwindled to a small river. The confluence of the Brahmaputra and Meghna was little south of Bajitpur, and below the confluence the river was known as the Meghna, though the former was the parent stream. In Rennel's time the lower reach of the Brahmaputra or Meghna was from four to five miles wide and it appeared to him 'as an arm of the sea'. The meanders of the Ganges between Boalia and Jaffergunge (modern Goalundo) were more pronounced than at the present time. North of the Ganges Rennell had seen a large expanse of marshes, and was of the opinion that "the

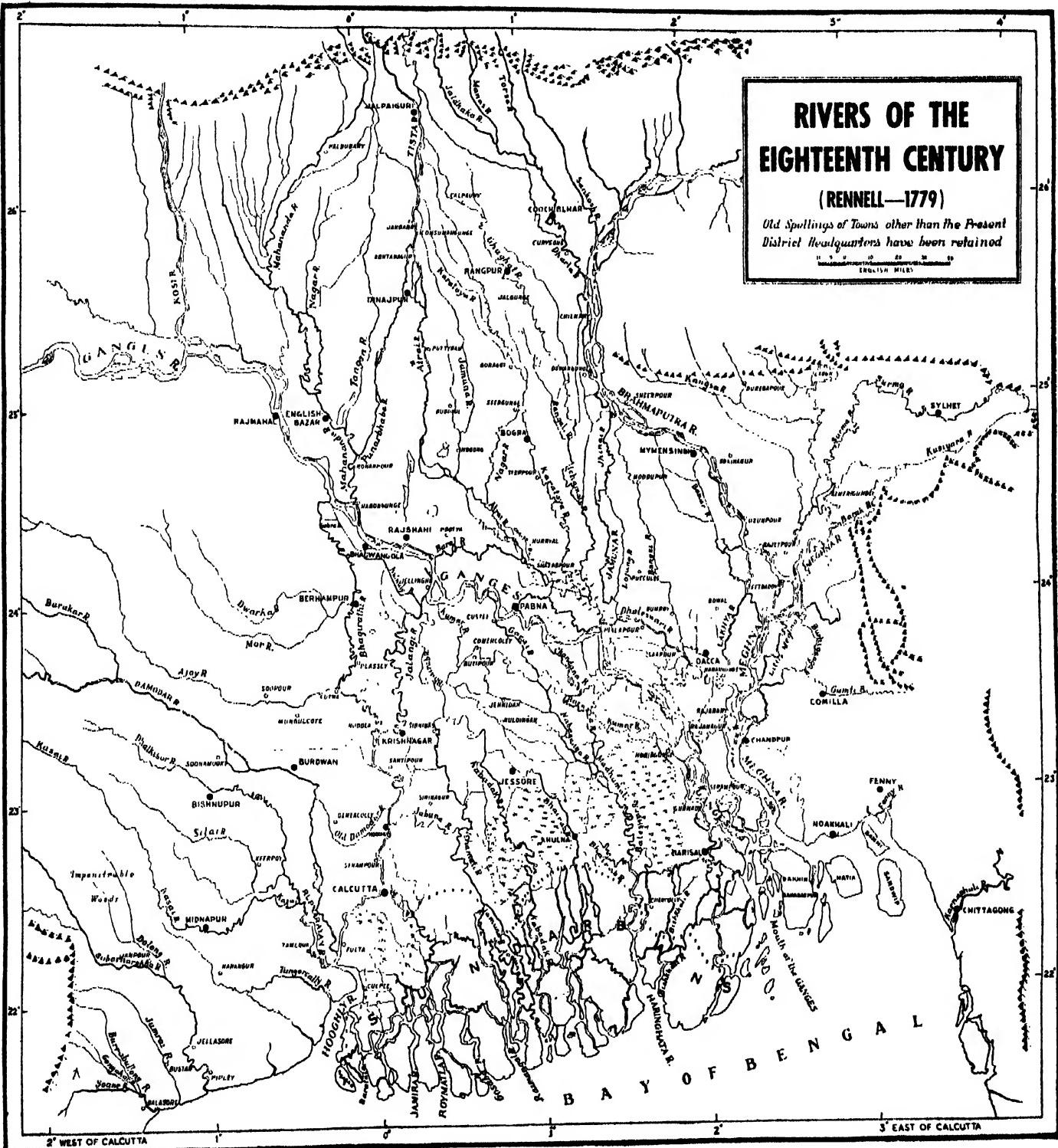
Ganges had its former bed in the tract now occupied by the lakes and morasses between Nator and Jaffergunge, striking out its present course at Boalia, and passing by Puttia." He also was of the opinion that the Dhaleswari was the original channel of the Ganges, when the latter used to join the Brahmaputra or Meghna near Fringybar (modern Narayanganj). Along the delta face he noticed no less than eight openings, each of which, according to him, had been in its time the principal mouth of the Ganges. In Rennell's time the Sundarbans were also composed of 'a labyrinth of rivers and creeks'. All of these carried salt water, except those that immediately communicated with the principal arm of the Ganges. Of the distributaries of the Ganges flowing through central Bengal the Chandana was the most important river. It was navigable throughout the year. Rennell did not refer to the Garai, as it must have been an unimportant river in his time. Next in importance was the Jalangi. The Cossimbazar (the Bhagirathi) river, as now-a-days, used to be dry from 'October to May'. In North Bengal the changes in the river courses since his time are no less striking. The Tista used then to join the Ganges. In its lower reach it used to 'run almost parallel to the Ganges for nearly 150 miles'. And during the dry season the waters of the Tista used to 'run into those of the Ganges by the two distinct channels, situated about 20 miles from each other'. The Tista waters also used to flow through the Punarbhava and a number of channels to the east including the Karatoya. West of the Bhagirathi the changes of river course are few. Even the Damodar had almost ceased to flow through its eastern channel before entering the Bhagirathi above Hooghly.

Map 5

RIVERS OF THE EIGHTEENTH CENTURY

(RENNELL—1779)

Old Spellings of Towns other than the Present District Headquarters have been retained



ROCKS AND SOILS

MAP 6

Hard consolidated rocks outcrop in limited areas in Bengal. The oldest of these are found in the western uplands, and also in the extreme north, forming the Darjeeling Himalaya and Buxa hills. In the east the rocks are less compact and much younger, and on erosion have given rise to ridges and valleys.

In the Darjeeling area Tertiary rocks (soft massive sandstones) occur as a narrow band along the foot of the Himalaya. Further north occur Gondwanas (sandstones, quartzites, shales, and beds of friable anthracite coal), overlain by a thousand feet of slates, phyllites, and quartzites (the Daling series). The higher slopes are formed of hard gneisses and mica-schists. A thorough prospecting of the hills may lead to the discovery of rich deposits of iron and copper ores, graphite and coal.

In the western part of West Bengal runs a belt of Archaean gneisses and schists along with intrusive granites. The town of Bankura stands near the eastern edge of this belt. The inliers of the Rajmahal basalt trap are found in Birbhum district in the neighbourhood of Nalhati. It is in one of the sunken basins of the Archaean terrain that the coal-bearing Gondwanas were deposited. Massive laterites also contribute to the formation of some of the high hills in this tract. This upland region is also rich in minerals. Here lies one of the richest coal deposits of India- the Raniganj coalfield. There are also deposits of iron, copper and tungsten ores. Mica and alluvial gold also occur in many places. Fireclay and chinaclay occur extensively in the Raniganj coal-field area, and also in Bankura district.

The eastern hills are composed mainly of upper Tertiary sandstones and shales, and are overlain in places by unconsolidated ferruginous sands and clays of Quaternary age. The main ranges are monoclonal, though there are some folds developed locally. These hills contain oil gas, petroleum and tertiary coals.

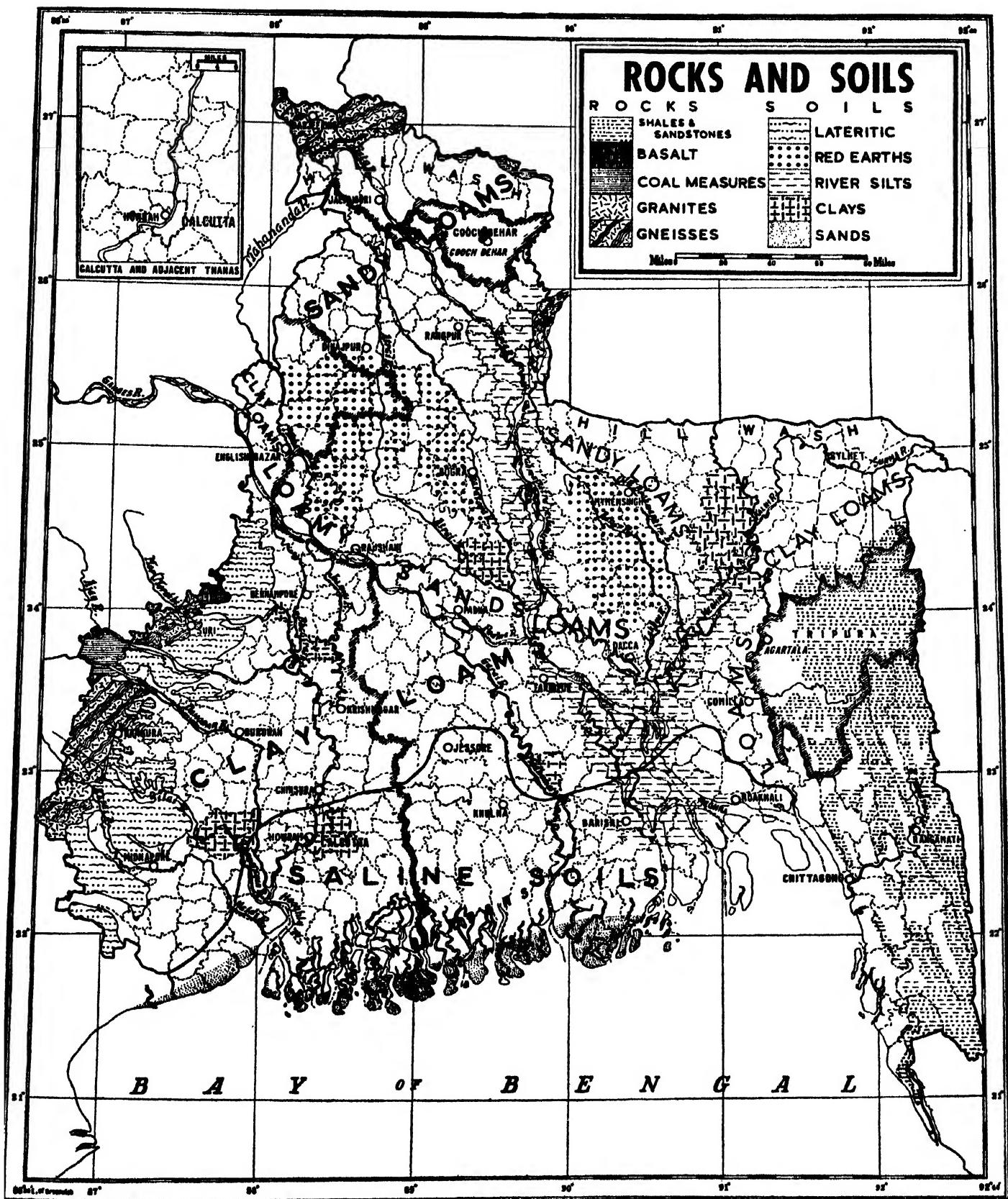
The map showing the distribution of soils is based on a reconnaissance soil survey. It is only in the case of lateritic and saline soils that their boundaries could be drawn. Red earths, river silts, sands and clays have also been differentiated from the rest.

Most of the soils are azonal with little or no profile development. They have been derived from alluvial deposits, forming flood and piedmont plains, and deltas; and in most cases they are some type of loam. On the basis of texture they have been divided into sands, loamy sands, sandy loams, river silts or silt loams, clay loams and clays. Pure sands occur mainly along the coast, forming coastal sand dunes. Loamy sands prevail along the northern bank of the Ganges. Sandy loams cover alluvial plains in the north. Along the banks of the Tista, Brahmaputra and Meghna rivers, silts or silt loams predominate. Elsewhere in the plains, clay loam is the predominating type of soil. Clays with or without muck soils occur in swamps and alluvial lakes. The hill wash, that is, alluvial fan debris, consists of gravels and coarse sands. This type occurs along the foot of the Darjeeling Himalaya and the Meghalaya. The soils formed on this material are not well developed, and are agriculturally useless. There is one type of intrazonal soil in Bengal, that is, saline soils. Alluvial soils along the coast and especially in the Sundarban area show white efflorescences of sodium chloride, as they are impregnated with this and other salts by tidal estuaries. In the eastern part of the delta where the mighty rivers carry sweet water, the percentage of salts in the saline soils is not high, and through this region the salts are considerably washed down during the rains.

Under the climatic conditions of Bengal, older alluvial deposits in the Barind region and Madhupur Jungle area, and the metamorphic and gneiss rocks in the West, got lateritized, giving rise to younger red earths in the first two areas, and older red earths or typical lateritic soils and laterites in the western part of West Bengal.

There are zonal soils, rich in sesquioxides of iron and aluminium, poor in silica, and almost devoid of colloidal matter. They are difficult to plough, and their fertility level is at a minimum. Red and yellow podzolic soils have developed on the gneisses and schists in the higher slopes of the Darjeeling Himalaya, and humus podzols in the valley bottoms and other depressions.

Map 6



NATURAL VEGETATION

MAP 7

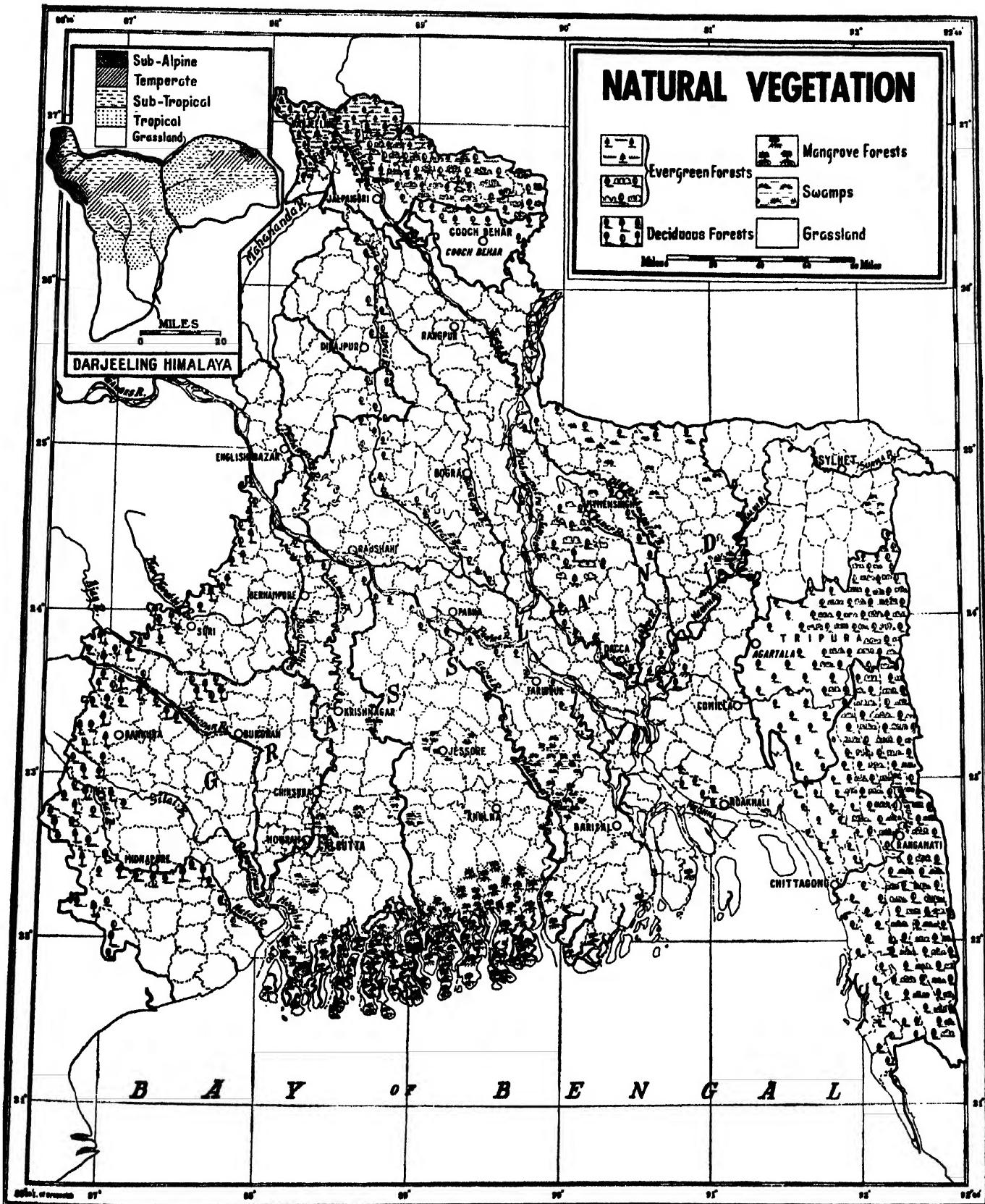
This map is based on a sketch-map, especially prepared for this atlas by Dr. S. K. Mukherjee, Curator of Herbarium, Lloyd Botanic Garden, Darjeeling. The classification of natural vegetation, as shown on the map, are on a basis of relief, moisture conditions and human interference. Man has cleared the tropical deciduous forest from the plains of Bengal to make room for rice fields and wherever land has been kept fallow it has given rise to grass plains. Forests of tropical deciduous type are however in strips in the plains, mainly along the river banks. Tree vegetation of luxuriant growth is found only in the north, south and east of the province, where the forests are reserved or protected by the Government.

The forests are of four types: (1) evergreen forest, (2) tropical deciduous forest, (3) mangrove forest, (4) swamp forest. Evergreen forests predominate in the north and east where the annual rainfall exceeds 100 inches, and the soils are moisture-retaining. The evergreen forests are of two types: (1) temperate evergreen forest; (2) tropical wet evergreen forest. In the Darjeeling Himalaya wet temperate evergreen type of forest predominates. Although this type is mainly a mixed one, there is a tendency for a few species to predominate in different altitudes. *Lauraceae*, between 6,000 and 7,000 feet; *Quercus lamellosa*, between 7,000 and 8,000 feet; *Q. pachyphylla*, between 8,000 and 9,000 feet. Moist temperate evergreen forest also occurs in the same mountainous region, generally above 5,000 feet. This type is characterised by the extensive development of coniferous forests. Wherever the ranges are exposed on the south, the conifers are replaced by evergreen oaks. Tropical wet evergreen forest occurs in the submontane tracts in Darjeeling and Jalpaiguri districts, and in Chittagong district and

Chittagong Hill Tracts. This type is characterised by large tall evergreen trees. Canes and other climbers are abundant, and epiphytes of all kinds, and bamboos are numerous. Chittagong evergreen forests are replaced in the west by tropical deciduous trees. Elsewhere, this type includes the following forests: (1) sal forests; (2) dry mixed forests; (3) plateau forests in West Bengal; (4) river forests and the open deciduous forests of south Bengal. Khair and sissu trees are first planted in newly deposited gravels and sands in the submontane tract as these trees act as a soil-binder, and later are replaced by sal trees. The uplands in West Bengal are covered in many parts with low jungle, sometimes quite dense. This scrub jungle is intermixed in the relatively inaccessible areas with trees of larger growth. The scrub forest contains 95 per cent of sal (*Shorea robusta*), and some mohuwa and palash trees. Mangrove and sundri forests occur in the Sundarbans. These are tidal. Mangrove forest is found along waterways, the banks of which are composed of soft tidal mud and go under water at every tide. Higher up, is found sundri forest, where the land gets flooded with moderately brackish water at every high tide. The sundri tree reaches a height of about 50 feet, and its wood is red in colour and excellent in quality, hard, tough and durable. Above 'salt water Heritiera forest' occurs 'fresh water Heritiera forest', which does not favour very brackish water. Nearer the coast the Heritiera is replaced by Rhizophoraceae and many smaller trees, which colonize the mud banks and flats.

The tree growth in swamps is scattered and poor. But the undergrowth is thick and difficult to penetrate, and consists largely of canes.

Map 7



RAINFALL MAP OF BENGAL

MAP 8

This map shows the distribution of normal annual rainfall in Bengal. The isohyetal lines have been drawn at an interval of 20, 10 and 4 inches. Of the main meteorological divisions of India, Bengal is the rainiest next to Assam, the normal annual rainfall being as high as 78.06 inches, about twice the normal annual rainfall of the whole of India. The entire agricultural life in Bengal is dominated by rains. The Bay of Bengal branch of the s. w. monsoon is mainly responsible for heavy rains in summer. It is augmented by depressions and cyclonic storms which originate in the Bay and blow over inland areas.

A study of normal annual rainfall figures as indicated on the map reveal that there are two widely separated regions, which receive the largest amounts of rainfall in Bengal. One of these regions is situated in the south-east coastal tract including the islands in the mouths of the Meghna, where the annual normal rainfall ranges from 120 inches on the north at Noakhali to 140 inches on the south at Cox's Bazar. The other region is situated in the mountainous tract in the north of Bengal, where the high ridges catch the full force of the s. w. monsoon. This mountainous tract could be further sub-divided into two regions, one lying to the west of the Tista, bounded by the 120-inch isohyetal line. Within this tract the rainfall increases steadily from the south, that is, from Jalpaiguri to as far as Kurseong (160 inches), and then begins to decrease northward all the way to Darjeeling (122 inches). The normal annual rainfall to the east of the Tista is somewhat higher. In fact, in this tract lies a region with a rainfall of over 200 inches—the maximum for Bengal. The cause of this higher rainfall is the abrupt rise of the Buxa hill from the plains of the Alipur Duars.

The isohyetal lines indicate clearly that the oceanic influence penetrates up the main valley from the mouth of the Meghna as far as the confluence of the Padma and Brahmaputra, the rainfall decreasing with the increase in distance from the river banks. The 80-inch isohyetal line can be taken as a typical example. The 70-inch isohyetal line shows the same feature along the valley of the Padma, but it also bends in a reverse direction in the eastern part of the Dacca district, and this feature is shared more or less by the isohyetal lines

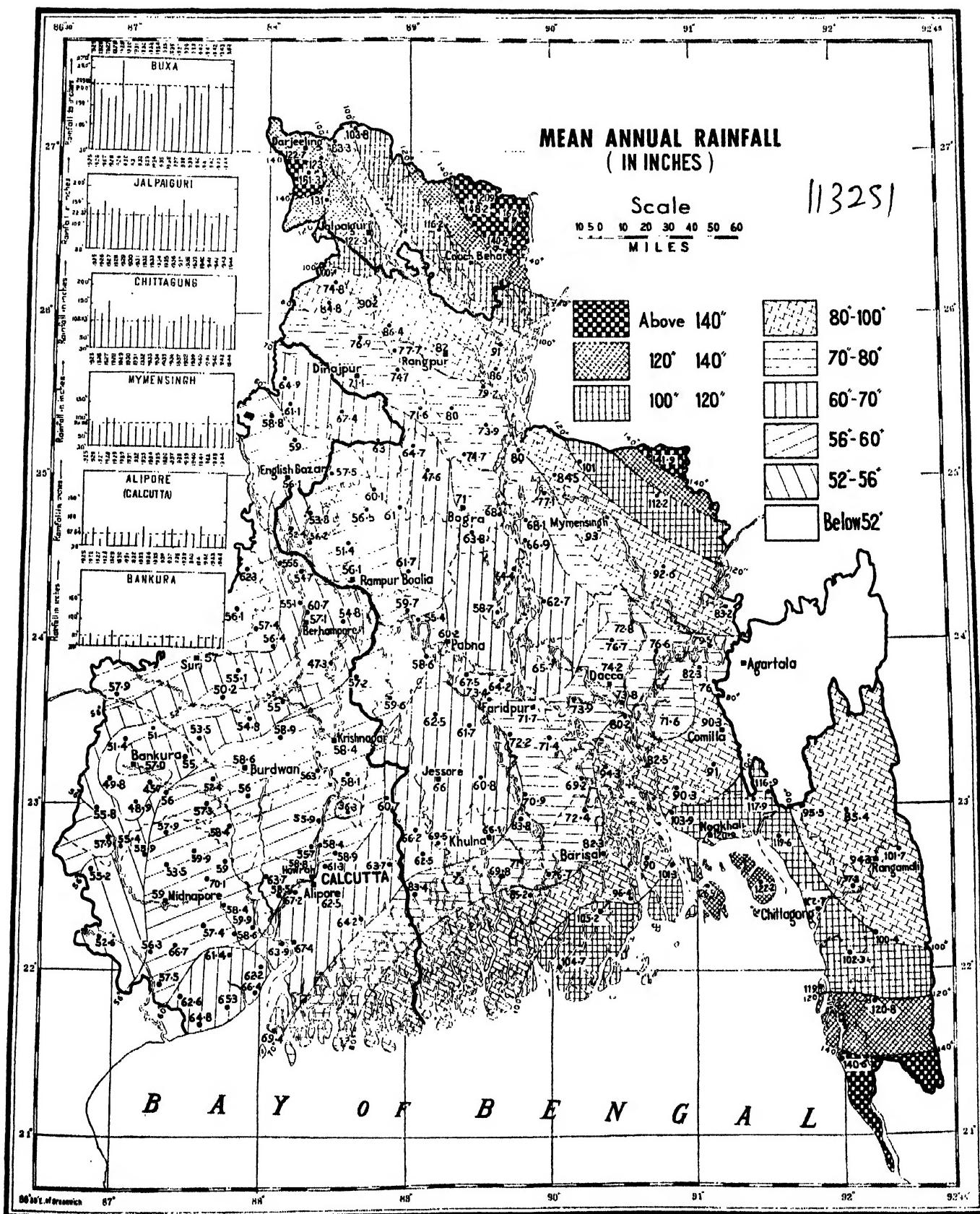
of lower rainfall as one proceeds westward. This may be taken as an indication of the continental influence penetrating into Bengal from the west, thereby minimising the effects of oceanic winds which not only prevail during the south-west monsoon period but also in other months of the year, especially during the Nor'wester period from mid-March to mid-May.

The penetration of oceanic influence has also been noticed up the valley of the Rupnarayan in S. W. Bengal, and also throughout the valley of the Ganges or Padma, beyond its confluence with the Garai. In fact, the trends of the isohyetal lines indicate that there is a constant juxtaposition between the oceanic and continental winds in Central and West Bengal, resulting in a greater or lesser local precipitation. In the greater part of North Bengal the rainfall regions form more or less parallel belts, rainfall increasing from the valley of the Padma north-eastwards to the extreme north-eastern boundary of the province. In the western part of South Bengal similar parallel rainfall belts of increasing intensity from west to east have been noticed. But farther inland this simple arrangement has been somewhat disturbed by the occurrence of a belt of slightly higher rainfall along the western border of the province from the Ganges valley to a little north of the Kasai. It is, however, within this tract that there occurs the largest continuous area with the minimum rainfall in Bengal (50 inches), extending from Bolpur to Taldanga. Just to the north of the Ganges lies another region of low rainfall, which lies principally in the district of Malda, extending for some distance into the adjoining district of Rajshahi. A clear example of a high rainfall area surrounded by a low rainfall region can be seen in the district of Burdwan, extending northwards from the town of Burdwan.

It is the uncertainty of rainfall that hampers agricultural activities in Bengal, more so in West Bengal. The bar graphs in the margin indicate the actual annual rainfall from 1925 to 1944 in relation to the mean annual rainfall (represented by dotted horizontal line) in six typical meteorological stations of West and East Bengal. In the northern hills (Buxa) the total annual rainfall remained less than the annual mean in most of the years, and one year (1929) had an exceptionally

(Continued on page 22)

Map 8



RAINFALL IN FOUR TYPICAL MONTHS

The four maps show the distribution of normal rainfall in four typical months—April, June, July and December.

APRIL

MAP 9

In the month of April the normal rainfall varies roughly between 1 and 8 inches. April rain facilitates the preparation of land for the sowing of jute, aus and broadcast aman rice. Rainfall of over 7 inches is recorded in a few stations, in the extreme north-east of Jalpaiguri (Buxa—8.3 inches), and in isolated pockets in East Bengal (Palang in Faridpur being the typical example, 8 inches). The prevailing rainfall in the region, lying east of the Brahmaputra-Padma-Meghna, is between 5 and 7 inches. This partly accounts for the agricultural prosperity of this region. To the west of it lies a belt of intermediate rainfall (3 to 5 inches), which is narrower in the middle, and broader in the north and south. Further west the rainfall is the lowest (1 to 3 inches). The whole of the main southern block of the present West Bengal province is included within this belt. Within this tract several stations receive even less than one inch, indicated by circles on the map (Monteswar in Burdwan, 0.56 inch; Indpur in Bankura, 0.74 inch; Asansol, 0.78 inch).

JUNE

MAP 10

In the month of June the south-west monsoon sets in, and heavy precipitation is recorded in all the stations. The normal rainfall ranges from 7 to 39 inches in West Bengal. A failure of rain in June is not rare, and when it happens it makes a good aus rice crop impossible and delays dangerously the preparation of seed beds for transplanted aman rice. Rainfall is found to decrease from south-east to north-west along the Meghna-Padma-Ganges axis. In this month very high rainfall is recorded in three areas, two lying in the northern mountainous region (Kurseong, 33 inches; and Buxa, 39 inches) and the other in the south-eastern coast (Cox's Bazar, 30 inches). The next highest rainfall (19 to 25 inches) is recorded in the rest of Darjeeling and Jalpaiguri districts and in Cooch Behar and the Tista Valley in the north; in the north-eastern part of Mymensingh (Durgapur), and in the coastal belt surrounding the mouths of the Meghna, including the islands. The region of the lowest rainfall for this month (7 to 10 inches) also lies in West Bengal, covering practically the whole of Burdwan and Hooghly districts, half of

Bankura and parts of Midnapore, 24-Parganas, Nadia, Murshidabad and Malda districts. The rainfall within the zone increases from east to west. This zone is narrower in the north and wider in the south. It is surrounded on all sides by a wider zone of higher rainfall (10 to 13 inches). Further west lies a still higher rainfall area (13 to 16 inches). The last two zones cover the greater part of Bengal.

JULY

MAP 11

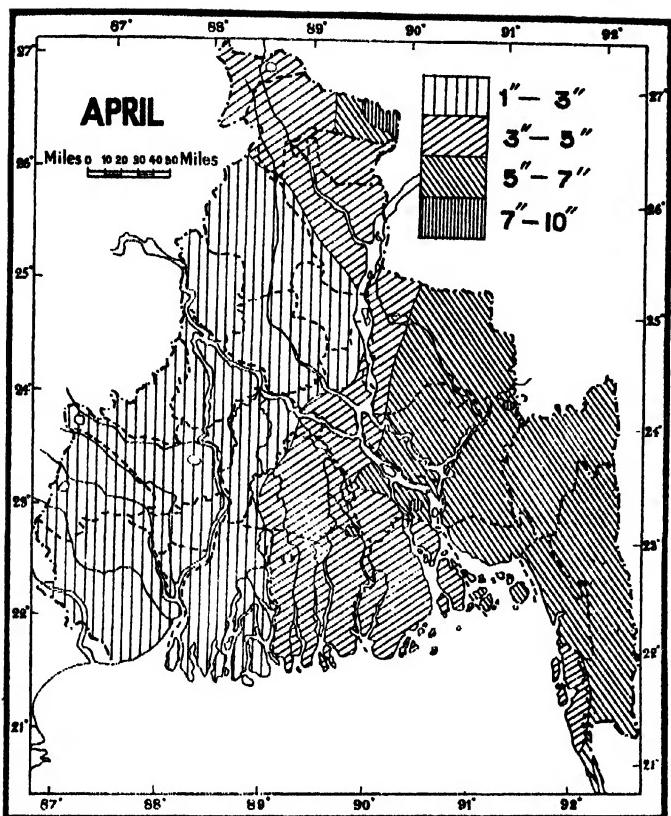
July is the雨iest month in Bengal. The map shows that the distribution of rainfall in this month is more uniform than in the preceding month. The normal rainfall ranges from 7 to 50 inches. Abundant July rainfall is essential for aus rice to ripen. A failure of rainfall in July may also mean a much higher rainfall in August, causing widespread floods. The areas with over 25 inches of rainfall coalesce in the north, covering practically the whole of Darjeeling and Jalpaiguri districts (Kalimpong area is the only exception). In Darjeeling Himalayas rainfall is much above 25 inches, varying between 31 and 43 inches, and in Jalpaiguri it is over 30 inches (Buxa—50 inches). The雨iest region in the south-east has become a little larger, though normal rainfall is not much above 25 inches, excepting at Cox's Bazar (36 inches). The area receiving less than 10 inches of rainfall has considerably decreased, and moved towards the east. The prevailing rainfall for the greater part of Bengal is between 10 and 13 inches, to the north and south of which rainfall increases.

DECEMBER

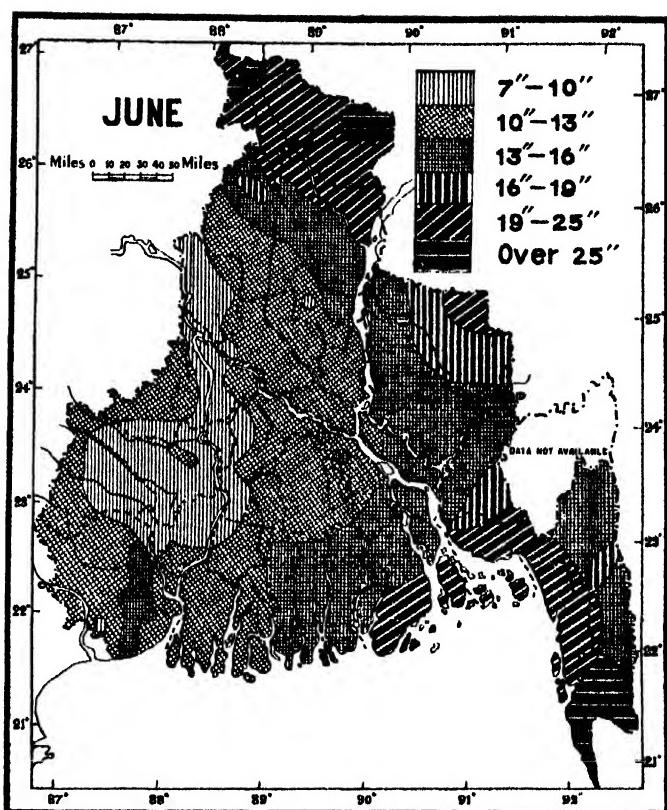
MAP 12

December is the driest month in Bengal, receiving only occasional showers. Nowhere does the normal rainfall exceed 1 inch. The dry weather is good for agriculture, as rains, if long continued in the month, help in the breeding of an insect which does considerable damage to aman crop, then almost ready for harvesting. The map shows that the prevailing rainfall for the greater part of Bengal is between 0.01 and 0.25 inch, and that the variation in rainfall from place to place is negligible in this month. It is only in the coastal belt around the mouths of the Meghna that normal rainfall is the highest for the month (Chittagong, 0.7 inch), somewhat higher than that of mountainous tracts in the north, where the normal rainfall for most of the stations is below 0.25 inch, and the normal rainfall of the雨iest Buxa region is only 0.6 inch.

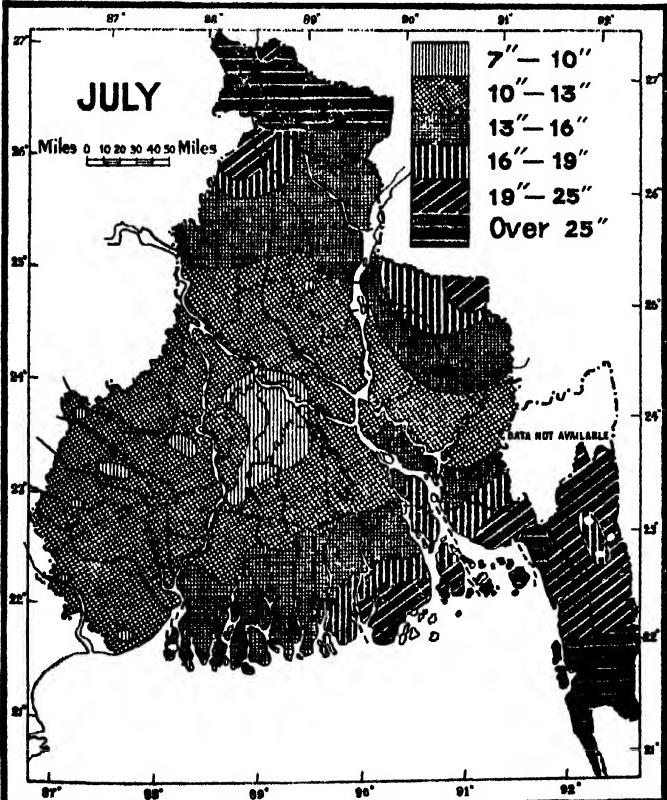
Map 9



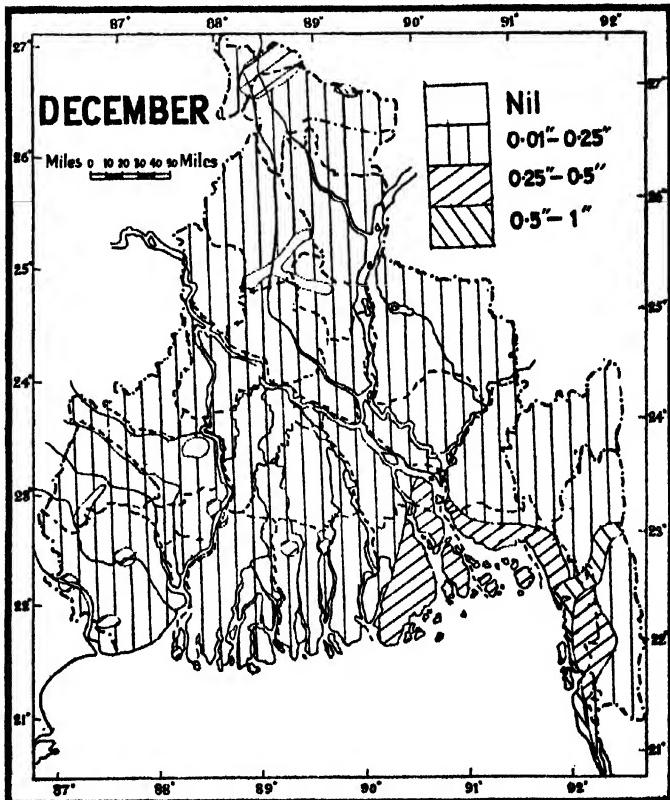
Map 10



JULY



DECEMBER



Map 11

Map 12

TEMPERATURE AND PRESSURE

On the following two maps isobars and isotherms relating to January and April have been indicated. In the case of isobars, pressure has been reduced to sea-level, but isotherms indicate actual temperature.

JANUARY

MAP 13

The pressure in the month of January varies between 29.95 and 30.05 inches, and the temperature ranges from 40°F to 70°F. Pressure increases roughly from south-east to north-west along with the increase of temperature from north to south. The isothermal lines run more or less straight from west to east, and the isobars are concave downwards. The pressure gradient is somewhat steep in the eastern part of East Bengal. The temperature gradient is somewhat steep in the southern parts of both West and East Bengal, and in the northern mountainous districts. In the north and north-west of Bengal occur two comparatively high pressure areas (marked H on the map).

APRIL

MAP 14

In April both the isotherms and isobars have changed their positions. The isotherms no longer run straight. They curve concave westward, somewhat symmetrically. Temperature is found to increase westward along with the decrease of pressure in that direction. This is due to the development of a low pressure system

in the north-western part of India. The isobars have also the same trends. There is not much difference in temperature and pressure gradients within this area.

MEAN MONTHLY RANGE OF TEMPERATURE

MAP 15

The mean monthly range is the least near the mouths of the Meghna (13°F), due to oceanic influence. This region has, therefore, a modified type of equatorial climate, so far as rainfall and mean monthly range of temperature are concerned. The oceanic influence penetrates up the valleys, though in a lesser degree. The tropical influence is felt in the west and east of the province, where the mean monthly range is the highest.

MEAN ANNUAL TEMPERATURE

MAP 16

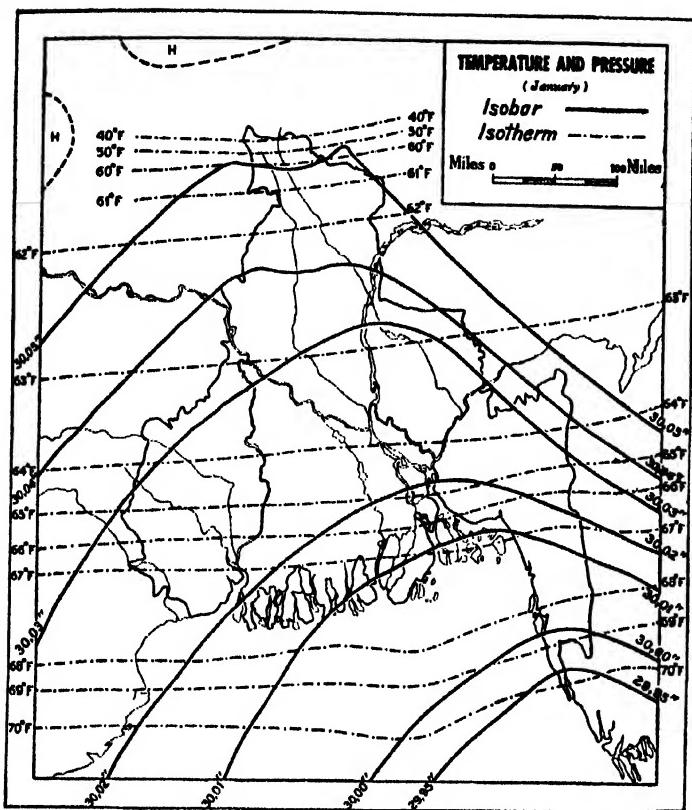
The western part of Bengal is definitely hotter than either the eastern or northern parts. The isothermal lines bend more prominently on the west, and become almost parabolic curves. The nature of the curves is due partly to oceanic influence, and partly to the main temperature system prevailing over Western India. Temperature is uniform over a wide area, extending north-west from the mouths of the Meghna. Away from the rivers the oceanic influence decreases, thereby increasing the temperature gradient. The temperature decreases more rapidly to the north due to the influence of altitude.

(Continued from page 18)

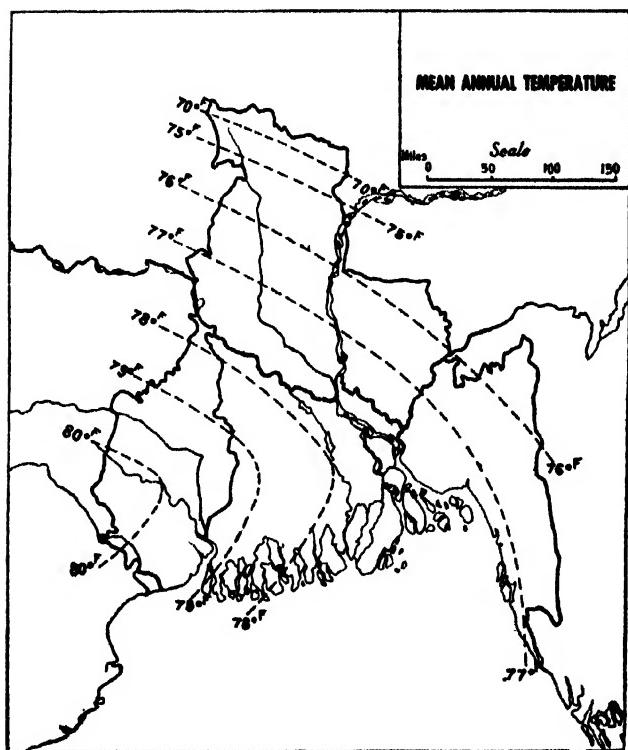
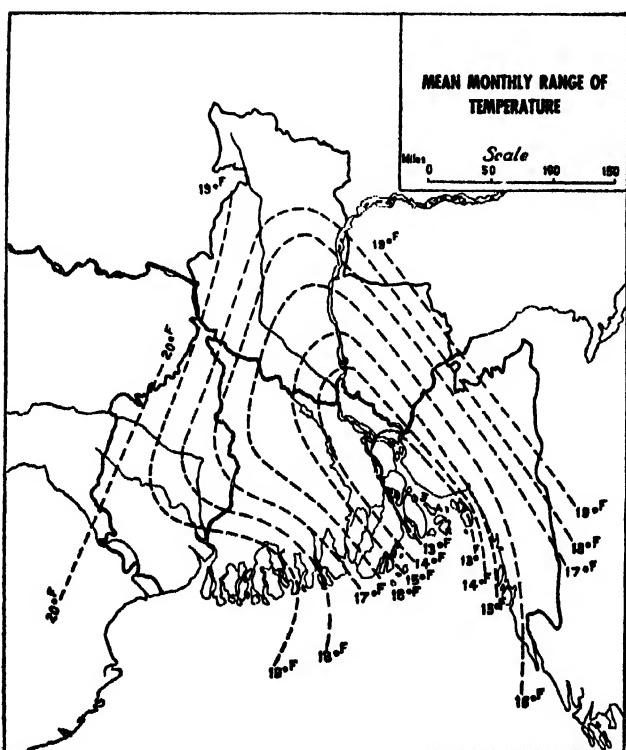
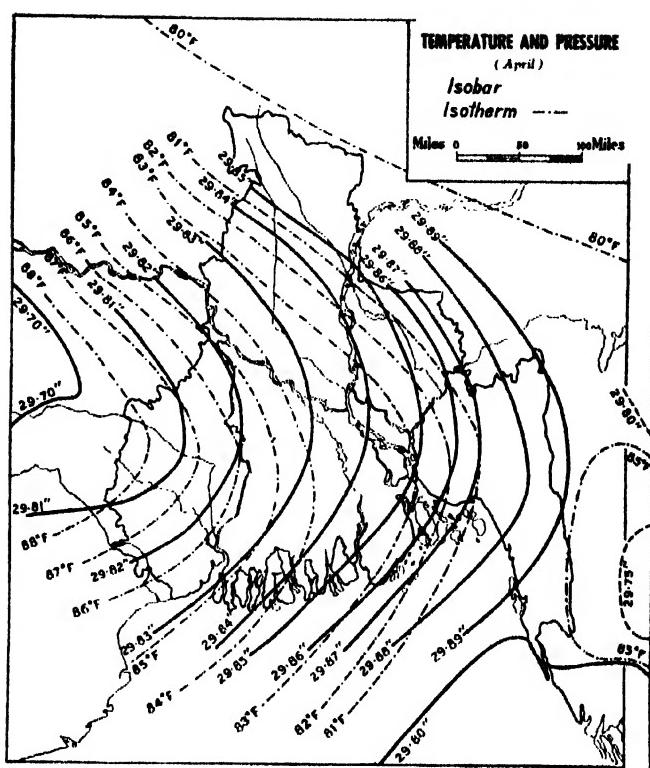
high rainfall. In the Terai area (Jalpaiguri) the annual variation was negligible. In West Bengal proper (Calcutta and Bankura) the variation of rainfall from year to year was considerable during the period under

investigation. In East Bengal the Southern Section (Chittagong) had a more or less uniform rainfall in most of the years, whereas the northern part (Mymensingh) rainfall was considerably below the annual mean.

Map 13



Map 14



Map 15

Map 16

STORM TRACKS AND WIND ROSES

The Meteorological Department of India published in 1925 a series of monthly charts of storm tracks in the Bay of Bengal for the period 1891-1923, which form the basis of the following three storm-track maps :

STORM TRACKS—MAY—JUNE MAP 17

In the pre-monsoon months, May and June, a number of storms originate in the Bay. During the period 1891-1923 most of the storms that acquired a gale force had their origin in the centre of the Bay. These storms moved either north-west or north-east and, on reaching the coasts, lost their gale force and gradually died out. A few storms also originated in the north of the Bay, and moved towards South Bengal. These pre-monsoon storms generally affect the coasts of Bengal, Orissa and Madras and also the Arakan coast.

STORM TRACKS—JULY—AUGUST MAP 18

During the typical monsoon months, July and August, the Bay presents a uniform picture of storm conditions. Most of the storms having gale force originate in the north of Bay and move west and north-west. In general, the trajectories over the Bay are short and simple, and storms travel a larger distance inland than over the sea, to die out a long distance away from the coast. It is clear that Bengal is not very much affected by the storms originating in these months. It is the Orissa coast that is affected most.

STORM TRACKS—OCTOBER MAP 19

October is undoubtedly the stormiest month, not only over the Bay, but also over the adjacent coasts. These storms may be grouped into two classes, based on their place of origin: (1) Western storms originating in the western part of the Bay, and (2) Eastern storms originating in the eastern part of the Bay. The frequency of

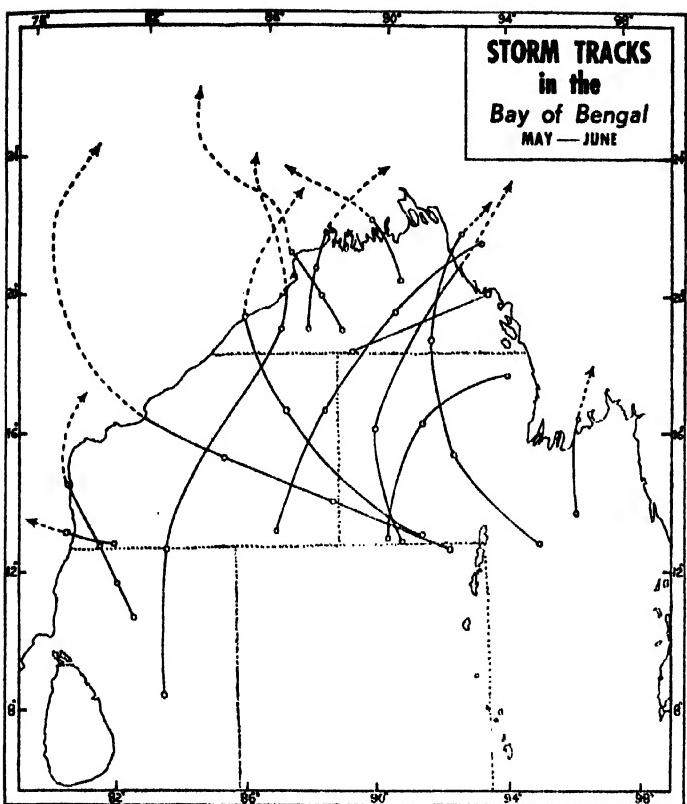
storms is much greater in the eastern part than in the west. Hence East Bengal coasts are subject to violent storms in this month. Orissa coasts are also affected by the eastern storms. West Bengal coasts, however, are least affected. None of these storms originated in the northern part of the Bay.

WIND ROSES MAP 20

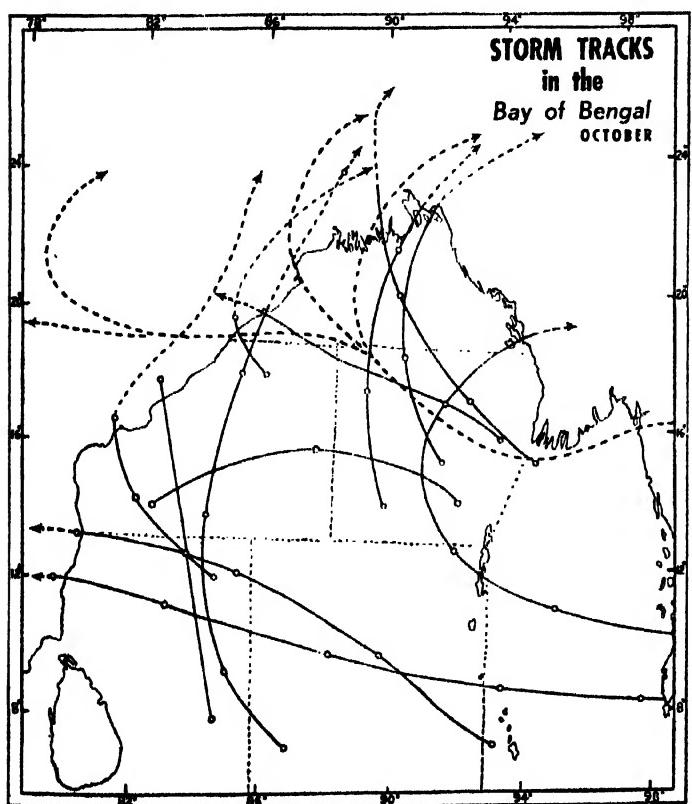
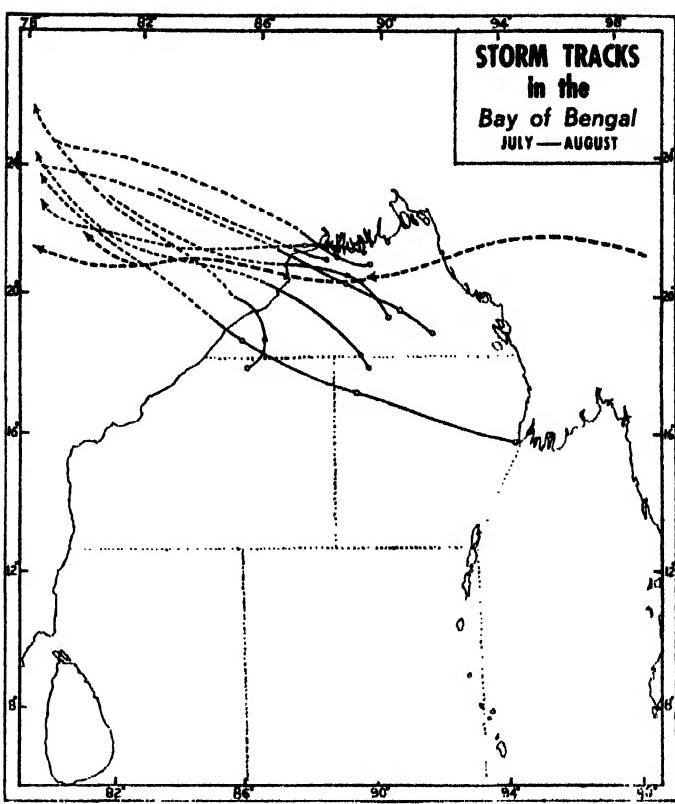
A glance at the wind roses for the year 1938 (recorded in the morning at 8 a.m.) reveals that the south-west monsoon changed its course on entering Bengal. It was the predominating wind at the Sandheads, an island in the Bay of Bengal, and as such arrived at Sagar and even farther inland, up the valley of the Hooghly at Calcutta. In no other part of Bengal was south-west the predominant direction. On the eastern coast the south-east was the main direction of winds. This direction also predominated up the Padma and in the greater part of the rest of East Bengal. In the greater part of Central Bengal and the southern half of West Bengal southerly winds were more frequent. In North Bengal the easterly winds were the most frequent. It is these winds that bring rains in monsoonal months in North Bengal.

The figures inside the wind roses represented number of calm days in the year. The calm conditions prevailed most in two areas—Dinajpur-Mymensingh in the north, and Calcutta-Midnapore in the south-west. It is only when the winds drop, especially in the hot rainy season, that the weather becomes oppressive. The Noakhali-Chittagong coast is the most windy region in the whole of Bengal. The winds had a gale force of over 60 miles per hour in the mountainous district in the north and were fairly strong in the south-east corner and up the valley as far as Faridpur. The regions with frequent calm conditions have naturally light winds.

Map 17

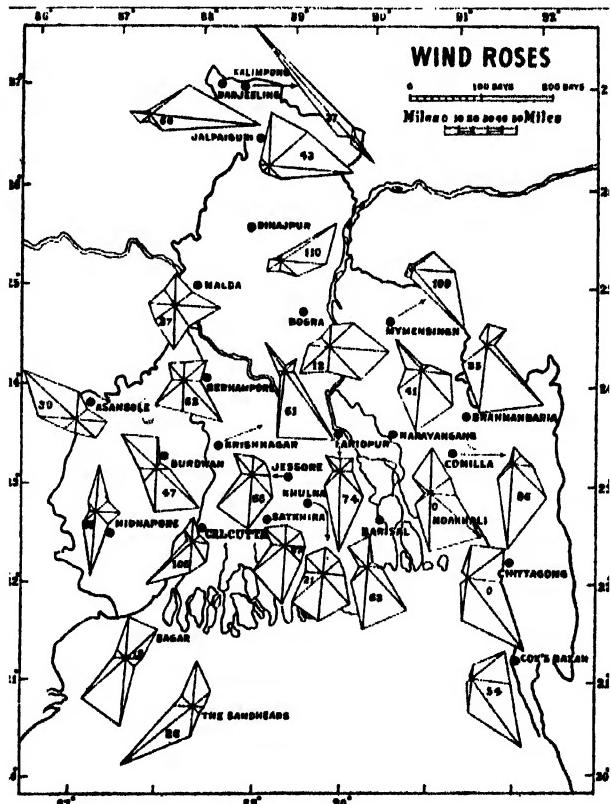


Map 18



Map 19

25



Map 20

ANNUAL MARCH OF TEMPERATURE

MAP 21

The graphs shown on this map represent the following temperature conditions for each month of the year in the twenty-four selected meteorological stations of Bengal:—(1) *the average monthly temperature*, indicated by the thicker central line in the graph for each station; (2 and 3) *the average monthly maximum and the average monthly minimum temperatures* indicated respectively by the lines immediately above and below the central line; (4 and 5) *the absolute monthly maximum and the absolute monthly minimum* of one typical year indicated respectively by the top line and the bottom line. Each graph is placed as far as possible directly over the location of the station it represents. These graphs show the annual march of temperature from month to month and enable comparison of important temperature data for different parts of Bengal. In Jessore the graph for average monthly temperature could not be drawn for want of data.

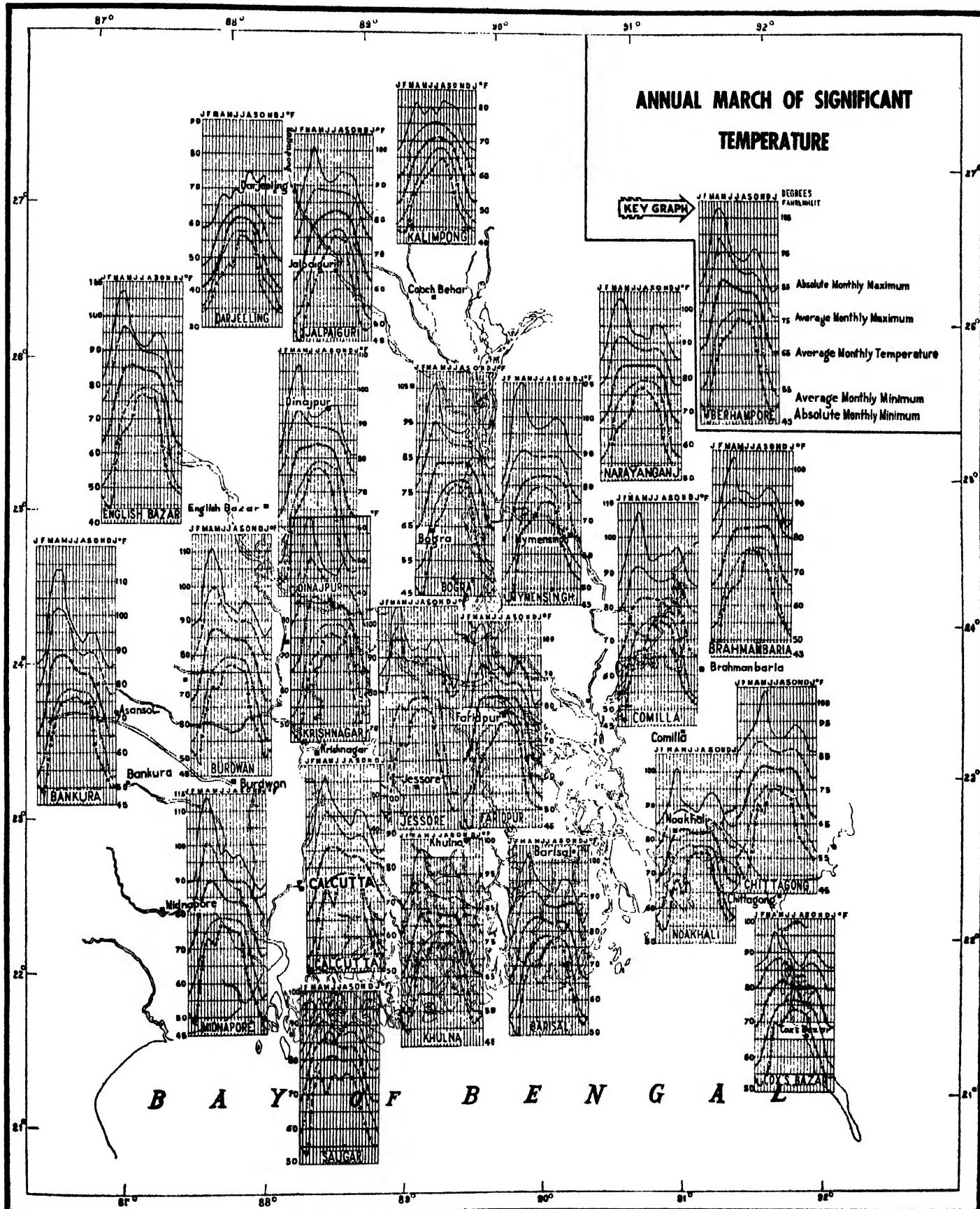
In the Himalayan stations the highest average monthly temperature occurs somewhat late, either in July or in August, and at Darjeeling this is lower than the lowest average monthly temperature recorded in the plains. In higher altitudes, four winter months, December to March have average monthly temperatures below 45°F, and four months in summer have a temperature slightly over 60°F. Winter sets in towards the end of December, and the temperature tends towards the freezing point. Further south, in Jalpaiguri, the summer months are much warmer, the average monthly temperature exceeding 80°F in five months, May to September. January is the coldest month, the mean monthly temperature being 62·4°F. Winter is short, lasting from the end of December to the end of February when the weather remains cool and pleasant, and the atmos-

sphere clear and bright. The graph representing Mymensingh shows the same trends, except that the winter months are warmer, the average monthly temperature hardly falling below 65°F in January. In Bogra six months in the year, April to September, show very little variation of average monthly temperature. The same temperature conditions prevail during the summer months in Narayanganj, Brahmanbaria, Comilla and Faridpur. In the south of Bengal the average monthly temperature continues to increase till May and then tends to decrease, first slowly and then a little faster. The stations situated in the west of Bengal record the highest summer temperatures and moderate winter temperatures.

The other temperature graphs follow more or less the same trends as that of average monthly temperature. The graph representing the absolute monthly maximum is the only exception. April records the highest monthly temperature in the year, except at Kalimpong and Chittagong, where another high temperature is recorded in September-October.

The nature of the temperature graphs indicates that there are at least four temperature regimes in Bengal: (1) Mountain type characterised by a steady rise of temperature till August, unaffected by the monsoonal rains (Kalimpong), (2) Northern Piedmont Plain type, characterized by a slow rise of temperature in summer months, due to the influence of monsoonal rains (Jalpaiguri), (3) Eastern type, characterized by uniform temperature during summer months, the typical curve having a flat top, (4) South and West Bengal type, characterized by double maxima temperatures. The latter type is well pronounced in West Bengal (Midnapore).

Map 21



SEASONAL TEMPERATURE AND RAINFALL

MAP 22

This map shows graphs representing seasonal temperature and rainfall in twenty-six meteorological stations in Bengal. The year has been divided into four seasons : Winter (December to February) ; Dry Summer (March to May) ; Wet Summer (June to September) ; Autumn (October, November).

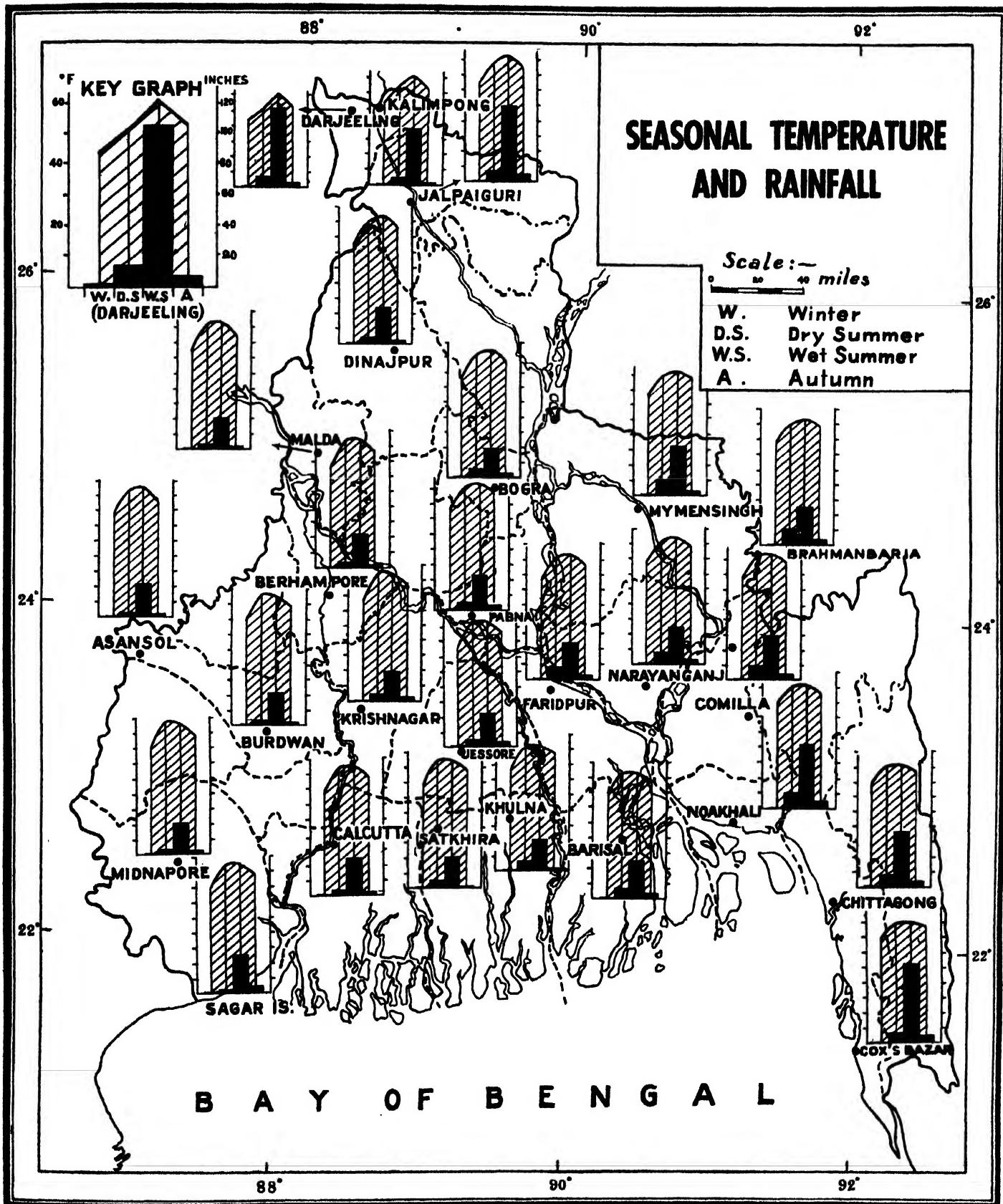
Seasonal Temperatures :—Bengal can be divided into six climatic sub-types, based on seasonal temperatures. In the mountains the four seasons are well defined (*see the key graph—Darjeeling*), there being about 10 degrees difference in temperature from one season to the other. Autumn, which is definitely cooler than the dry summer season in the plains, is not so in the hills. The northern plains extending in a north-east-south-west direction from Jalpaiguri to Malda are cooler in winter than any other part of the Bengal plains. Here, the rise of seasonal temperature from winter to summer is pretty high, about 20°F, and there is a steady increase of temperature from dry summer to wet summer. This may be termed a modified continental type of climate. The coastal areas both in the east and west are warmer in winter than inland tracts, the winter temperature veering round 69°F. But the influence of onshore winds is felt more in the east Chittagong coast, than in the west Calcutta coast. In the former the rise of temperature is about 10°F from winter to summer, but in the latter, the rise is 16°F. The former also differs from the latter in having a slight rise in temperature from dry summer to wet summer, whereas the reverse is the case in the latter type. Autumn is also slightly more defined in the latter type than in the former.

A broad belt extending from Brahmanbaria to Satkhira shows maritime influence in a lesser degree, the winter

being somewhat cooler and the rise of temperature being higher than those of either of the coastal tracts. A transitional type prevails further north over an area extending from Mymensingh to Berhampore. For example, Mymensingh, lying on this belt, has a winter cooler than that of Chittagong but warmer than that of Dinajpur.

Seasonal Rainfall :—In an agricultural country like Bengal, it is the seasonal distribution of rainfall that is of utmost importance to the cultivator. The absence or scarcity of rainfall in the dry summer season results in a bad summer and autumn crop, and also reduces the yield of winter rice. Winter rains enable the cultivator to grow cereals like wheat and barley. The striking characteristic of the seasonal distribution of rainfall is the preponderance of rains during the period June-September, that is, at the time when rains are needed for the cultivation of jute and winter rice, the two most important crops of Bengal. The percentage of rainfall during this season, which is hot and rainy, varies between 61 and 92. Generally speaking, the rainfall is more evenly distributed in the eastern part (Brahmanbaria, Narayanganj etc.) than elsewhere in Bengal. The mountainous and submontane regions in the north receive over 80 per cent of the rains during the rainy summer. The pre-monsoon rains (dry summer season), often associated with Nor'wester winds, occur most in the north-eastern plains of Bengal, over 20 inches of rainfall being recorded in Mymensingh, Brahmanbaria and Comilla. Relief or equatorial influence also causes precipitation during this period. Winter is more or less a dry season in Bengal, not more than 2 inches falling in any part. Autumn rains help in the ripening of aman rice. It is the eastern coast that receives the maximum autumn and winter rains.

Map 22



CHANGES IN POPULATION, 1901-11

MAP 23

The population of Bengal increased from 4,28,89,453 to 4,63,13,621 during the first decade of the present century, an increase of 6 per cent. This increase was by no means evenly distributed throughout the province. Some parts, especially in the west and centre recorded an actual decrease of population, whereas there was a general increase in population in the greater part of East and North Bengal. The range of changes in population has been indicated on this and the three following maps from an increase of over 40 per cent (black) to a definite decrease (white), when calculated from the previous census figures. In between the two extremes there are found intermediate types indicated by graduated shades on the map.

Several districts of Central and West Bengal—Jessore, Nadia, Murshidabad, Birbhum, Burdwan, Bankura, Midnapore, Hooghly and Howrah suffered terribly from a virulent type of malarial fever called Nadia or Burdwan fever, which raged between 1862 and 1874 and depopulated the countrysides. Malaria in a milder form persisted during the decade 1901-11 and took its annual toll. Cholera and small-pox also joined hands with malaria, and caused heavy mortality. In West Bengal, the rolling uplands of Burdwan, Bankura and Midnapore districts are well-drained and comparatively free from malaria, hence there was some gain in population, but this could not be very great because of infertile soils, scarcity of water for agricultural purposes, and the 1902 floods on the Mor and other rivers. Further east lie the low agricultural plains of Burdwan, Bankura, Hooghly and Midnapore, which are subject to inundations from the Damodar, Ajay, Silai and Kasai rivers, and are extremely malarious. There was consequently a decrease of population in this decadent tract, which is bounded on the east by a more prosperous belt running from north to south covering the western Murshidabad district, practically the whole of Birbhum and Howrah districts, and eastern parts of Burdwan (Katwa), Hooghly (the whole excepting Arambagh) and Midnapore districts (Contai and Tamluk). The increase was the highest from Chinsura to the confluence of the Damodar and the Hooghly due to development of industries. The expansion of Kharagpur town as a railway centre caused a rapid rise of population in the south of Midnapore. Across the river in Calcutta and 24-Parganas district conditions between 1901 and 1911 favoured a growth of population, due to very

great activities in manufacturing and industrial centres along the river banks, and to the reclamation of Sunderbans in the south and east, which had been opened up by the newly constructed railroads.

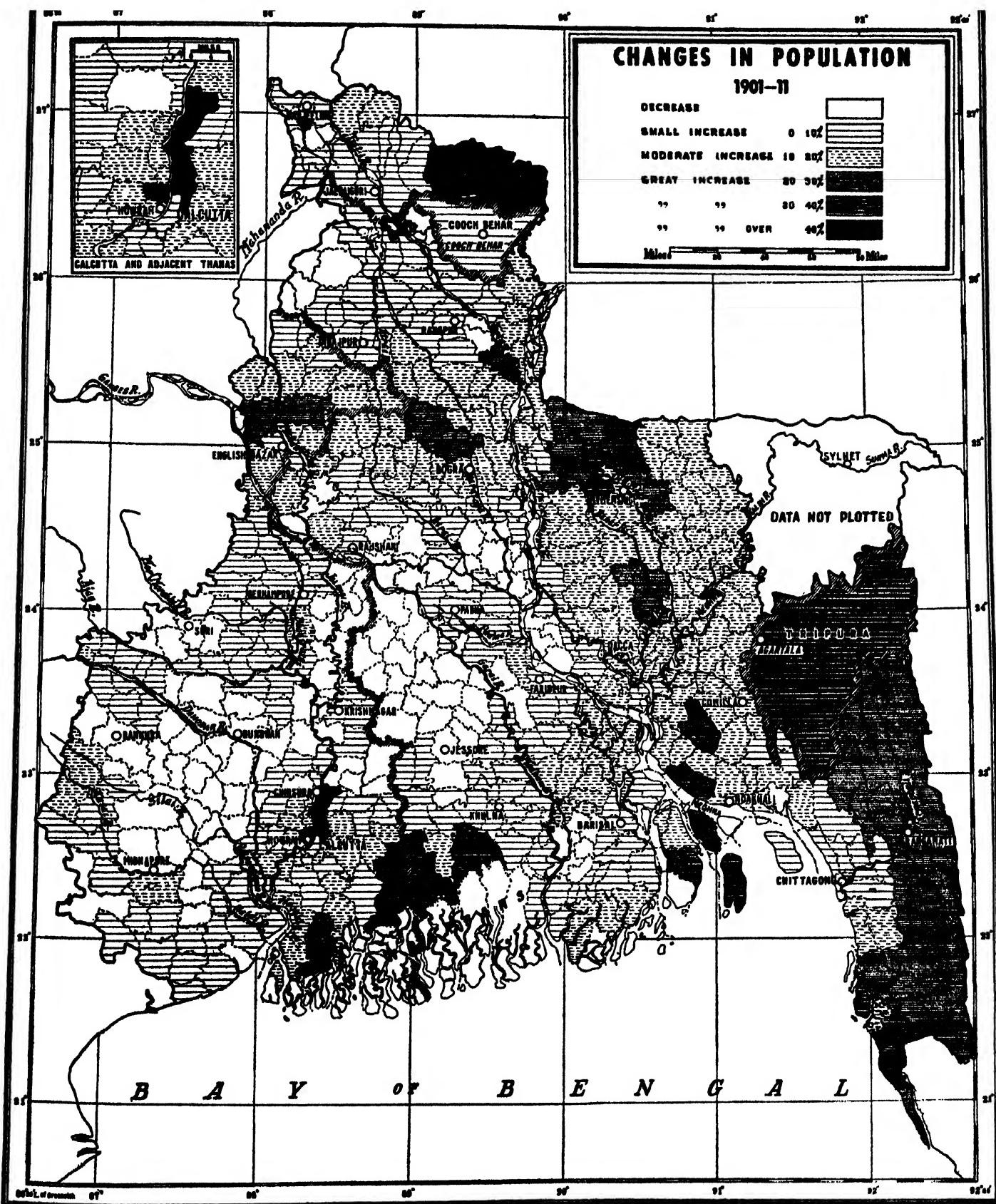
Nadia was ravaged by malaria, and there were epidemics of cholera as well, with the result that, except for a small portion now lying within the present province of West Bengal, the whole of the district recorded a decrease in population. The eastern part of Murshidabad and practically the whole of Jessore were even more malarious than Nadia, where deaths far exceeded births, hence these parts are shown unshaded on the map.

The malarious zone of Murshidabad and Nadia continued north across the Padma into south-eastern part of Rajshahi (Natore) and eastern part of Pabna (Sirajganj), a region of declining population. The cultivable wastelands of the Barind were opened up by Santal immigrants during this decade and that accounted for the gain in population in the central part of North Bengal (10-20%). The increase along the eastern fringe of Rangpur, bordering on the Brahmaputra was due to immigration of Muslim cultivators into the charlands from Mymensingh and Pabna districts. The decrease in the northern part of Dinajpur was due to malaria. The Alipur Duars region of Jalpaiguri lying north of Cooch Behar, recorded a phenomenal rise in population due to the clearing of jungles and extension of tea cultivation.

East Bengal proper presented a different picture altogether. There was an increase of 10 to 20 per cent of population practically everywhere. This part of Bengal is annually flushed by flood waters and the human interference with the river channels is the minimum, with the result that soils are extremely suited to the cultivation of jute and several rice crops, and people do not generally suffer from malaria. These are some of the geographical causes that led to the growth of population uniformly.

The sparsely populated Chittagong Hill Tracts and Tripura State attracted large numbers of immigrants, and hence the former showed an increase of 23 per cent and the latter 32 per cent. There were undoubtedly some variations within the State and the district which could not be shown on the map, *due to lack of data.*

Map 23



CHANGES IN POPULATION, 1911-21

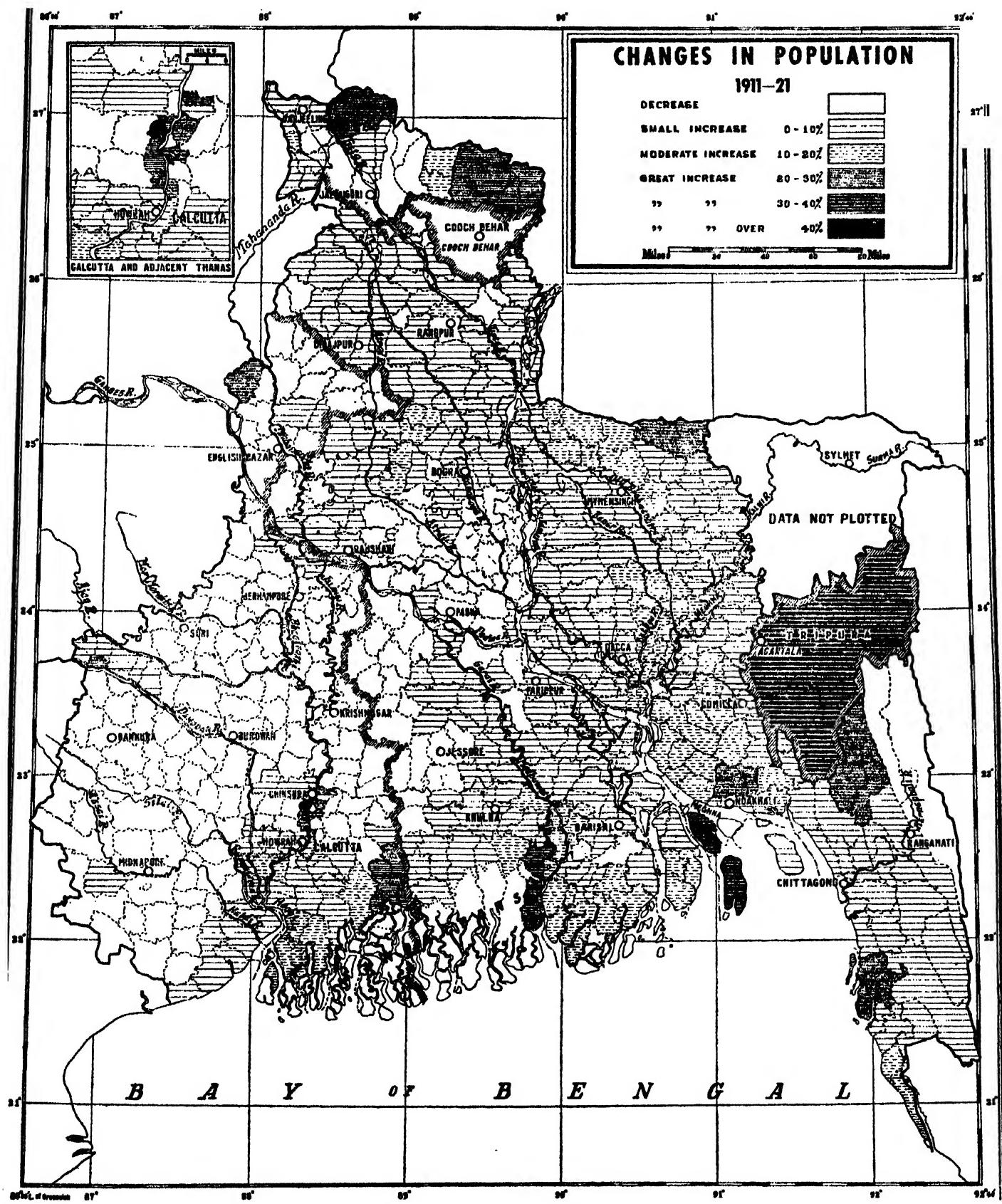
MAP 24

The population of Bengal between 1911 and 1921 increased by 1,287,292, that is, 2·8 per cent. The increase was not spread evenly over the province. The greater part of what is now West Bengal lost in number of inhabitants during this decade. In the greater part of East Bengal, on the other hand, there was an increase in population. The slow rise in population during the decade was due to various causes. War, floods, famine, and diseases like malaria and influenza were the contributing factors. The First World War, which broke out in 1914, caused a widespread disturbance of economic conditions and an abnormal rise of prices. This led to a decrease in births, if not to an increase in deaths. The influenza epidemic of 1918 caused great loss of life. Malaria was also responsible for increasing the death-rate. The Damodar floods of 1913 caused destruction of life and standing crops in Burdwan, Hooghly and Howrah districts. The other rivers of West Bengal, the Darakeswar, Sylai and Rupnarayan were also in flood, submerging large tracts in the south-eastern part of Midnapore district. The failure of crops was serious in Bankura district, causing a widespread famine in 1915-16. West Bengal suffered most from these calamities, and hence there was a decrease in population during this decade. The industrial area of Asansol was one of the exceptions, where coal mines attracted a large number of immigrants. The decrease in population in Midnapore and Bankura was partly due to emigration. Bhadreswar on the Hooghly had the highest increase in population, due to a phenomenal growth of the jute-mill industry. The increase in population in the district of Howrah was due to its proximity to Calcutta, and due to the development of the jute and other factory industries in the district. Across the river the population did not increase appreciably in the neighbourhood of Calcutta due to the existence of a long line of marshes. There was, however, a moderate increase of population along the fringes of the Sundarbans, which were being reclaimed from the virgin forest. The decrease in population in Central Bengal districts—Murshidabad, Nadia and Jessor was mainly due to waterlogging caused by the deterioration of once active distributaries of the Ganges, and high incidence of malaria. This explains the increase in population along the Garai, the only active

distributary following through this part. In Nadia district there was a decrease of 8 per cent during this decade. There was an increase in Khulna district, because of the better river conditions. East Bengal presented a different picture especially along the Madhumati-Haringhata river. Across the Haringhata river the Sundarbans of Barisal were cleared, and settled, hence the increase in population. North of the reclaimed Sundarbans the moderate increase in population in low-lying marshy tracts of Barisal and Faridpur districts was due to reclamation by sturdy Namasudras. North of the Padma there was an increase in population throughout Dacca and Mymensingh districts, more so in the eastern part of Dacca district due to the extension of jute cultivation, and in the northern part of Mymensingh district due to immigration and to considerable extension of land under the plough. East of the Meghna the increase in population was still greater. Noakhali and the south-west of Tippera recorded very large increases because of the greater proportion of agricultural land under cash crops, like betelnuts, jute and chillies. The two islands in the north of the Meghna contained virgin soils and attracted a large number of farmers from the mainland, hence a great increase in population was recorded there. In Chittagong district the largest increase in population was in the islands of Kutubdia and Maiskhal and the adjoining coast on the mainland, as these rich agricultural regions were comparatively free from cyclonic storms during this decade. In the Chittagong Hill Tracts there was an increase of population only in the Ramgarh region, and a decrease in the eastern rugged uplands. The imposing growth of population in Tripura State was mainly due to immigration from the neighbouring plains and hills.

There was a great increase in population in sparsely populated parts of Darjeeling and Malda districts, a moderate increase occurred in the north-west of Bogra and adjacent areas, and a decrease in a belt running from the middle of Rajshahi to the south-east corner of Pabna due to erosion of the northern bank of the Padma. Malda was the most affected district due to malaria and emigration. Elsewhere, there was, in general, an increase in population.

Map 24



CHANGES IN POPULATION, 1921-31

MAP 25

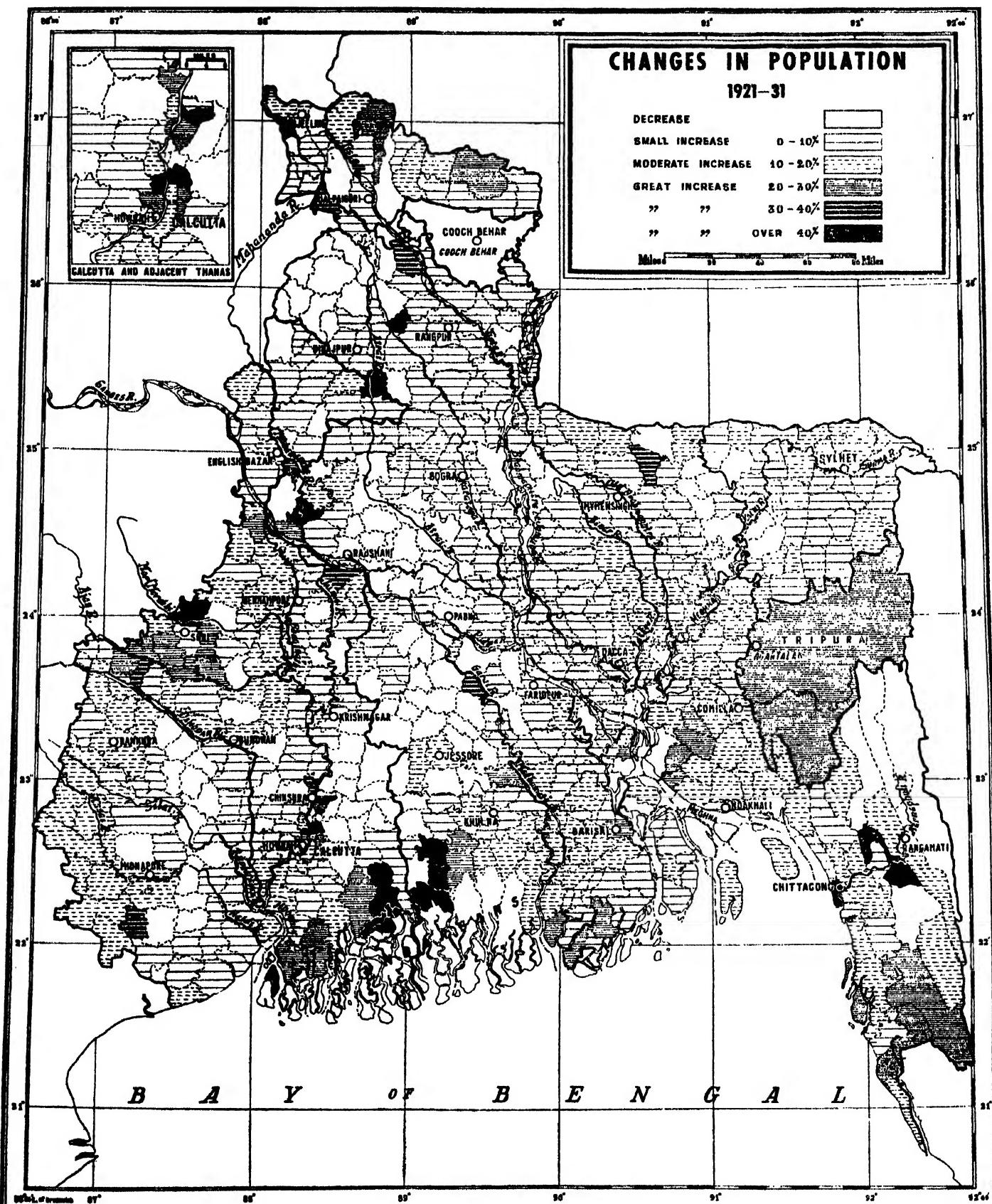
The population of Bengal between 1921 and 1931 increased by 3,36,271, that is by 7.3 per cent. The increase, unlike that of the previous decade, was more evenly spread out, though several areas recorded an increase of over 10 per cent of population, as indicated by dark patches on the map. In general the decrease in population was more pronounced along a longitudinal belt running from Darjeeling in the north to east of Calcutta in the south through parts of Dinajpur, Rajshahi, Pabna, Nadia, Jessore and 24-Parganas districts. As in the previous decade, malaria, floods, and uneven seasonal distribution of rain and consequent scarcity of foodstuffs were partly responsible for checking the normal growth of population. Trade depression in the tea, coal and jute industries prevented large-scale immigration into the province during this decade.

In the area lying west of the Bhagirathi-Hooghly system there was an increase in population in all the thanas bordering on the river excepting at Siaganj a few miles north of Berhampore, due to the closing down of a number of silk factories. The general increase in the area lying between the Ajay and Brahmani rivers was due to employment of Santals in railway workshops and rice mills, and also due to some improvement of health, causing excess of births over deaths. The same factors, as well as industrial activities in Raniganj and Hooghly areas caused an increase in population of the area bounded by the Ajay, Damodar and Hooghly rivers. The construction of the Damodar and other irrigation canals also helped in the increase of population in the area. South of the Damodar river there was a moderate increase in population along a wide belt in the west due to immigration of Santals into jungles and wastelands, establishment of small-scale factory and cottage industries in the northern part of Bankura district, and to freedom from epidemic diseases. To the east of this undulating upland lies a waterlogged area, where an endemic type of malaria was prevalent, causing a decrease in population. This was more marked in the Bishnupur subdivision of Bankura district. The gain in population was found to increase towards the Hooghly river, as in the

previous decade. White patches cover a large area of the map in between the Bhagirathi and the Garai, indicating a decrease in population in the greater parts of Nadia, Jessore and 24-Parganas district. Further deterioration of river channels, and malaria were the principal causes of depopulation of the countryside within this tract. The increase in population along the northern fringes of the Sundarbans was high indeed, due to extension of cultivation and reclamation of cultivated fields, which were submerged under salt water during cyclonic storms in the previous decade. East Bengal continued to present the same picture as in the previous decade. The tracts with a gain in population (10—20%) extended much further during this decade, and covered practically the whole of Tippera, Noakhali and Chittagong districts. Even in parts of the Chittagong Hill Tracts there was a considerable gain in population at Chandraghona and Rangamati because of the prosperity of trade in cotton, paddy and forest products. The population of Chittagong and its suburbs increased considerably due to the development of industries in the port. In Tripura State the rate of increase somewhat slowed down during this decade, but nevertheless the population increased by a quarter. Immigration into tea gardens and other forest clearings was primarily responsible for the increase. In Bakarganj district the reclamation of the Sundarbans resulted in a considerable gain in population in the southern part, and the excavation of new khals had a similar effect on the southern part of the district.

The doab of the Padma and Meghna presented more or less the same picture as in the previous decade, the eastern healthy industrial and commercial area of Narayanganj and Munshiganj recording a bigger growth of population than the western malarious agricultural plain of Manikganj. Further north the Mymensingh district was also free from malaria except in parts of Tangail subdivision, and recorded an increase of population except in the low-lying area where water-hyacinth and early floods played havoc with crops, reducing rice-growing land by 75 per cent. Emigration to Assam was also responsible for a decrease of population in the northern parts of Mymensingh district.

Map 25



CHANGES IN POPULATION, 1931-41

MAP 26

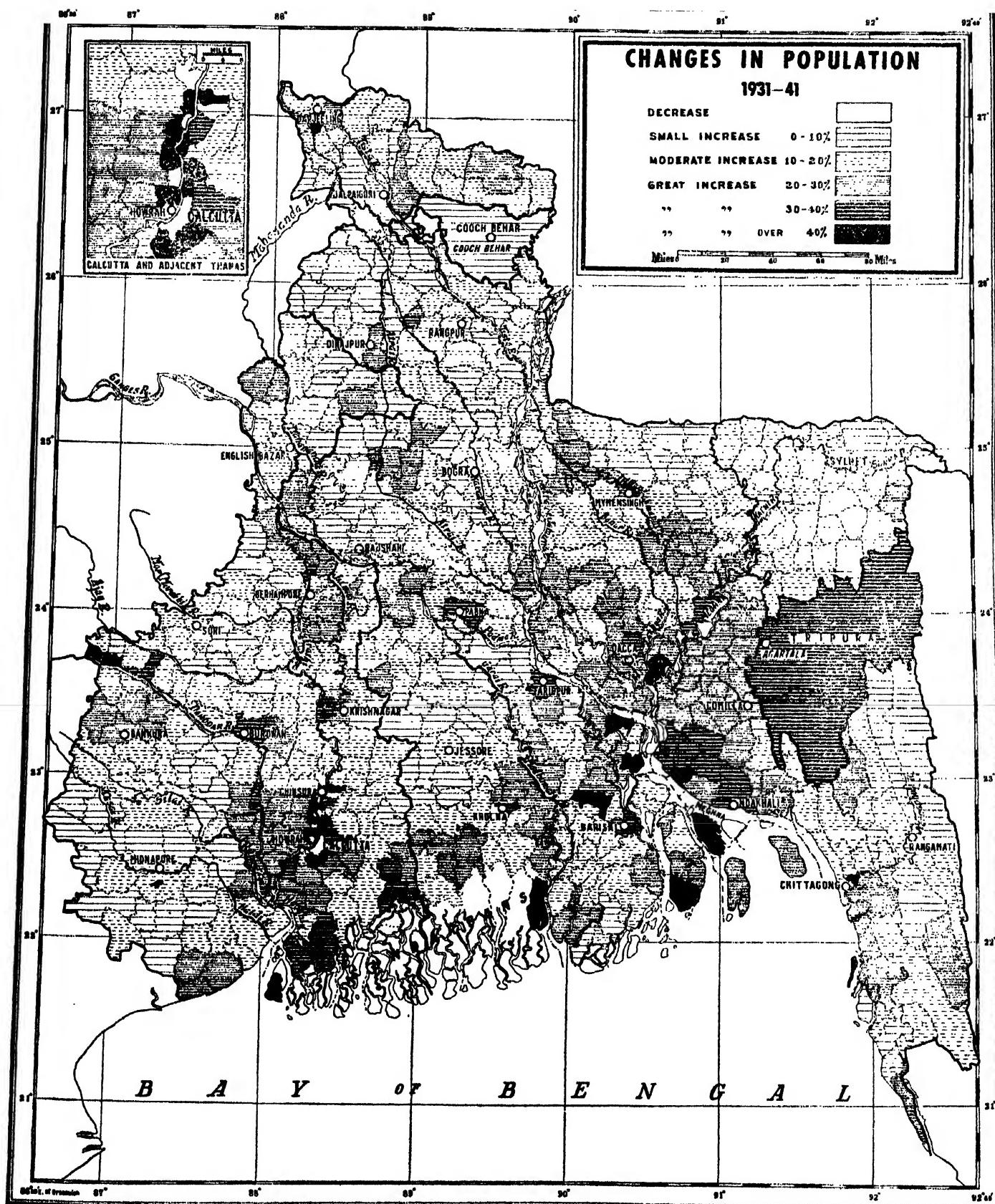
From 5,10,88,884 inhabitants in 1931, the population of Bengal had risen to 6,14,60,377, that is, a 20 per cent increase in 10 years. The map shows that the number of inhabitants during this decade increased in every part of Bengal excepting Magra and Uttarpara on the Bhagirathi, and Pachagar in the north. This unprecedented growth of population was certainly not due to any improvement of material conditions of the people. It was during this period that both political and economic situations remained critical. The amount and distribution of rainfall in most of the years were also unfavourable for agriculture. Floods often damaged standing crops, or a deficiency of rainfall in the growing season resulted in partial, and in some areas complete, failure of crops. Then in 1939 came the Second World War which complicated the economic situation still further. Hence, doubts have been expressed regarding the accuracy of 1941 census figures. The explanation of the exaggeration of population may be sought in the Communal Award of the British Government which took into account only the numerical strength of the two communities and divided them into two watertight compartments.

In the greater part of West Bengal the increase in population was rather slow, especially in the Balurghat red earth region, the low-lying malarious areas, and the infertile western uplands of Bankura and Midnapore districts. The population of the Asansol industrial area increased by a little over 50 per cent, though the adjoining Raniganj area did not have as great an

increase, because of the depression in the coal-mining industry. The increase was much higher in the Calcutta industrial area. There, the maximum growth was seen in the Muslim-majority thana of Metiabruz (139% increase), while two other thanas, Bijpur and Noapara, doubled their population. As in previous decades, the densely populated parts of Howrah and Hooghly districts adjoining the Calcutta industrial region had a remarkable growth, and they now formed a compact block, covering an area of over 2,000 square miles. The northern fringe of the Sundarbans could still absorb more people, and hence its population also grew rapidly, the greatest increase being near the mouths of the Hooghly river (Sagar : 43%). There was also a considerable increase of population in rural and semi-urban areas bordering on the Ganges, Mahananda, Bhagirathi and Damodar rivers, due to either immigration or to the relative healthiness of the tracts.

The map also shows that East Bengal had a rapid growth of population over a much wider area. This included practically the whole of Tippera and Noakhali districts, and the greater part of Dacca district, with prolongations in Mymensingh, Faridpur and Bakarganj districts. The increase in population was slower in the western part of East Bengal, stretching from north of Dinajpur to south of Jessore, that is, in the region of dead and dying rivers and of high incidence of malaria. Of the two States, the increase of population in densely populated Cooch-Behar (8% increase) was much slower than in sparsely populated Tripura (34% increase).

Map 26



DENSITY OF POPULATION, 1941

MAP 27

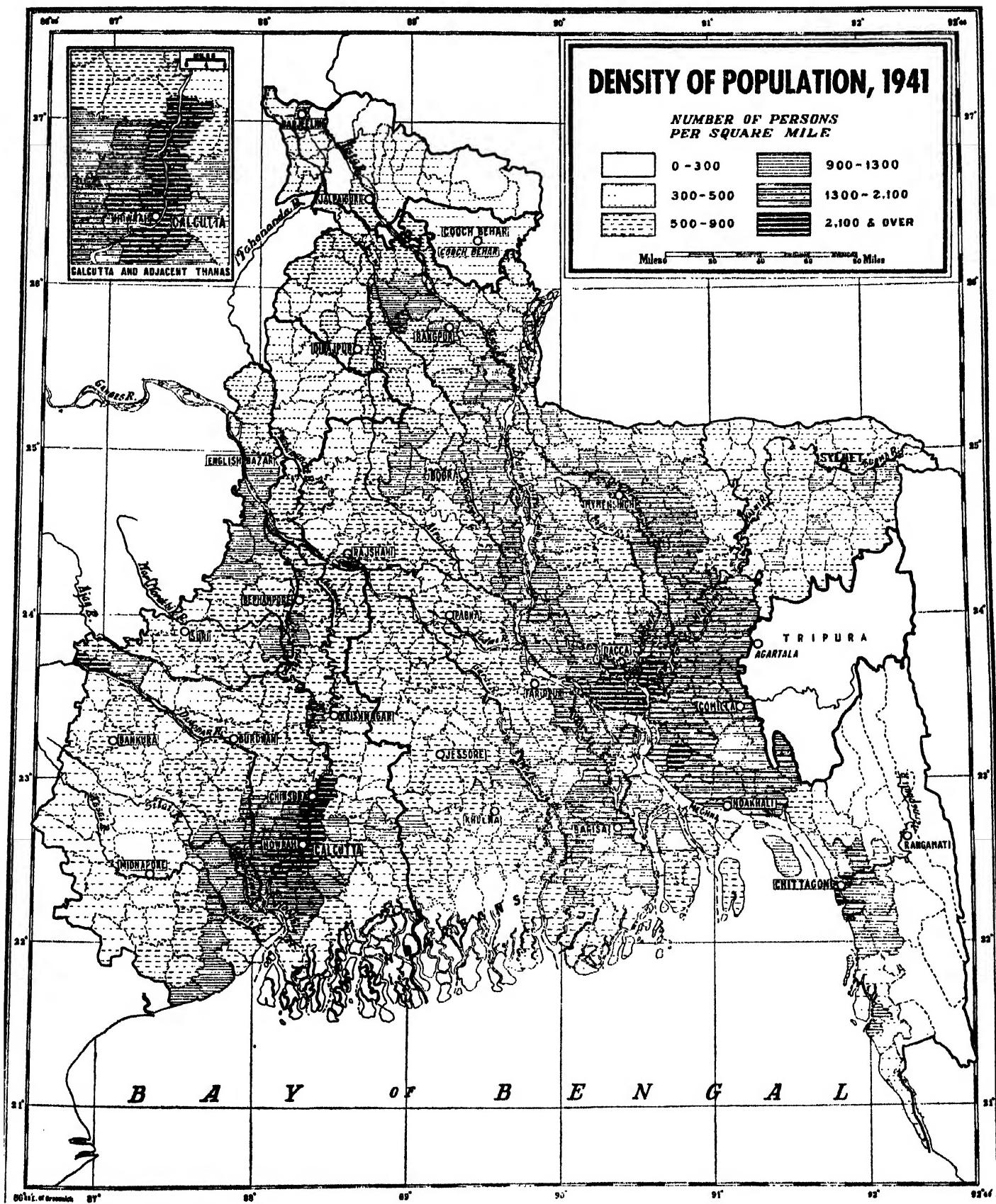
The map shows that the distribution of population is extremely uneven in Bengal. For the whole of Bengal (West and East Bengal including the two States) the density of population to the square mile amounted to 734 in 1941, a very high figure as the majority of the people are dependent on agriculture. The density in East Bengal (777) was slightly higher than that in West Bengal (705). The basins of active rivers swarm with people, hence high densities form continuous belts and run from north to south, especially in East Bengal. One of the belts starts from near the confluence of the Tista and Brahmaputra, and follows the present course of the Brahmaputra. Two other belts come from the north, running along the old course of the Bramaputra, and the other along the Meghna, and coalesce with the former. All the three then form a wide belt a little north of Dacca, and continue as such almost to the sea coast. Within this wide belt lie the industrial heart and capital city of East Bengal. This belt of high densities covers an area of about 16,000 square miles and has a population of 2,25,28,000, that is, a density of 1,400 to the square mile. In other words, 52 per cent of the population of the present East Bengal province live on 30 per cent of the total area. The concentration of population is still higher near the confluence of the Padma and Meghna. There, some 16,25,000 people live on approximately 550 square miles, the density being about 3,000 to the square mile. This density is almost as high as that of the highly industrialized Ruhr district of Germany. It is true that this part of Bengal is endowed by nature with extremely fertile soils, which get annually enriched by regular floods of the three mighty rivers of India—the Ganges, Brahmaputra and Meghna, and of innumerable streams coming down from the Meghalaya in the north and from the hills in the east; and that a considerable number of people are engaged in trade, especially in the Bikrampur area and also in cottage and factory industries which are developing along the banks of the Lakhya river. It is also the healthiest part of Bengal, being almost free from malaria, especially the whole tract lying east of the Meghna. But considering all these points, it can be said that the pressure of population on land is enormous, almost to bursting point. The sparsely populated Madhupur Jungle appears as an island. The eastern parts of East Bengal form one block of

sparse population, the density decreasing towards the south. Sylhet and the adjoining part of the Mymensingh district contain extensive marshes, called haors, which can be utilised only in the cold weather for catching fish, growing boro rice and grazing cattle, hence the density, 600 to the square mile, appears to be small compared to that of the belt of high densities just described. The gravelly soils along the foot of the Garo and Khasi hills are also partly responsible for keeping down the density. South of the Sylhet plains lie the sparsely populated Tripura State and Chittagong Hill Tracts. There, relief, inaccessibility, dense vegetation and malaria in low-lying valleys are the causes of low density, 125 to the square mile in the Tripura State and only 49 in the Chittagong Hill Tracts. Another region of relatively sparse population lies along the sea face, between the Haringhata and Meghna rivers, where swamps and tidal creeks are yet to be reclaimed and protective measures against the damage often caused by cyclonic storms and tidal waves are yet to be undertaken. The south-east coast is more densely populated, mainly due to fertility and to the development of Chittagong as a port. This coast has also suffered from cyclones, storm-waves and malaria.

The Sunderbans, especially the East Bengal portion, are almost a desert. No one is allowed to build a permanent house in the reserved forest areas. Hence at the time of the 1941 census only 7,474 persons were found to live on 2,314 square miles of Khulna Sundarbans. Most of these people must have been found living in boats and engaged in collecting forest products. North of the Sundarbans lies a wide belt of relatively low density, which stretches from north to south throughout the entire length of Bengal. The Bhagirathi-Hooghly runs near the western edge of the southern portion of this belt which comprises the greater part of Khulna district, and practically the whole of Jessore and Nadia districts and the north-western part of Faridpur district. Generally speaking, it is a land of moribund rivers and obstructed drainage and is ravaged by malaria. More or less the same conditions prevail on the north bank of the Ganges. There, the presence of red earths in the Barind area is also a contributing factor in lowering the density of population. Despite the rapid development of the tea

(Continued on page 40)

Map 27



RURAL AND URBAN POPULATION

MAP 28

The map, based on 1941 census figures and field work shows the population patterns in Bengal. The distribution of dots, (each dot representing 1,000 rural population) shows that most of the people, as elsewhere in India, live in villages. In 1941 there were as many as 90,000 villages in Bengal. The towns, on the other hand, numbered only 156, containing 5,933,290 inhabitants (about 10 per cent of the total population). Calcutta and its satellite towns, as shown in the inset map, were responsible for as many as 3,549,957 urban population even in 1911, and since then there has been a considerable influx of population to that area. The Bhagirathi-Hooghly river may, therefore, be taken as the axis of urban population in Bengal. In West Bengal there is another concentration of urban population in the coal mining region, the four towns--Asansol, Burnpur, Kulti and Raniganj containing over 1 lakh of people (1,11,737). In East Bengal, Dacca city, the most important urban centre, in 1941 contained over 2 lakhs of persons (2,13,213), its port, Narayanganj, containing another 56,000. Chittagong, the principal port of East Bengal, had a population of about a lakh in that year (92,301). Since the creation of East Bengal

as a province in Pakistan both Dacca and Chittagong will continue to draw more and more people, at least for a few years to come. The remaining towns are found scattered both in West and East Bengal. They are either district head-quarters, or trade centres, or railway towns like Kharagpore.

So far as the distribution of rural population is concerned, this map presents more or less the same picture as the preceding one showing the density of population. Generally speaking, the river basins of East Bengal are more densely populated than those of West Bengal. The Ganges, before its confluence with the Brahmaputra, is an exception to the rule. The northern bank, both in West and East Bengal, is very sparsely populated because of the prevalence of sandy soils and strings of depressions which get submerged practically every year during the floods. The lateritic region of West Bengal is also sparsely populated. In East Bengal the density of rural population is very high throughout the region. Besides the river basins, the flat plains of Tippera, Noakhali and Chittagong adjoining the eastern hills are densely populated.

DENSITY OF POPULATION, 1941

(Continued from page 38)

industry and immigration, large parts of Darjeeling and Jalpaiguri are still very sparsely populated.

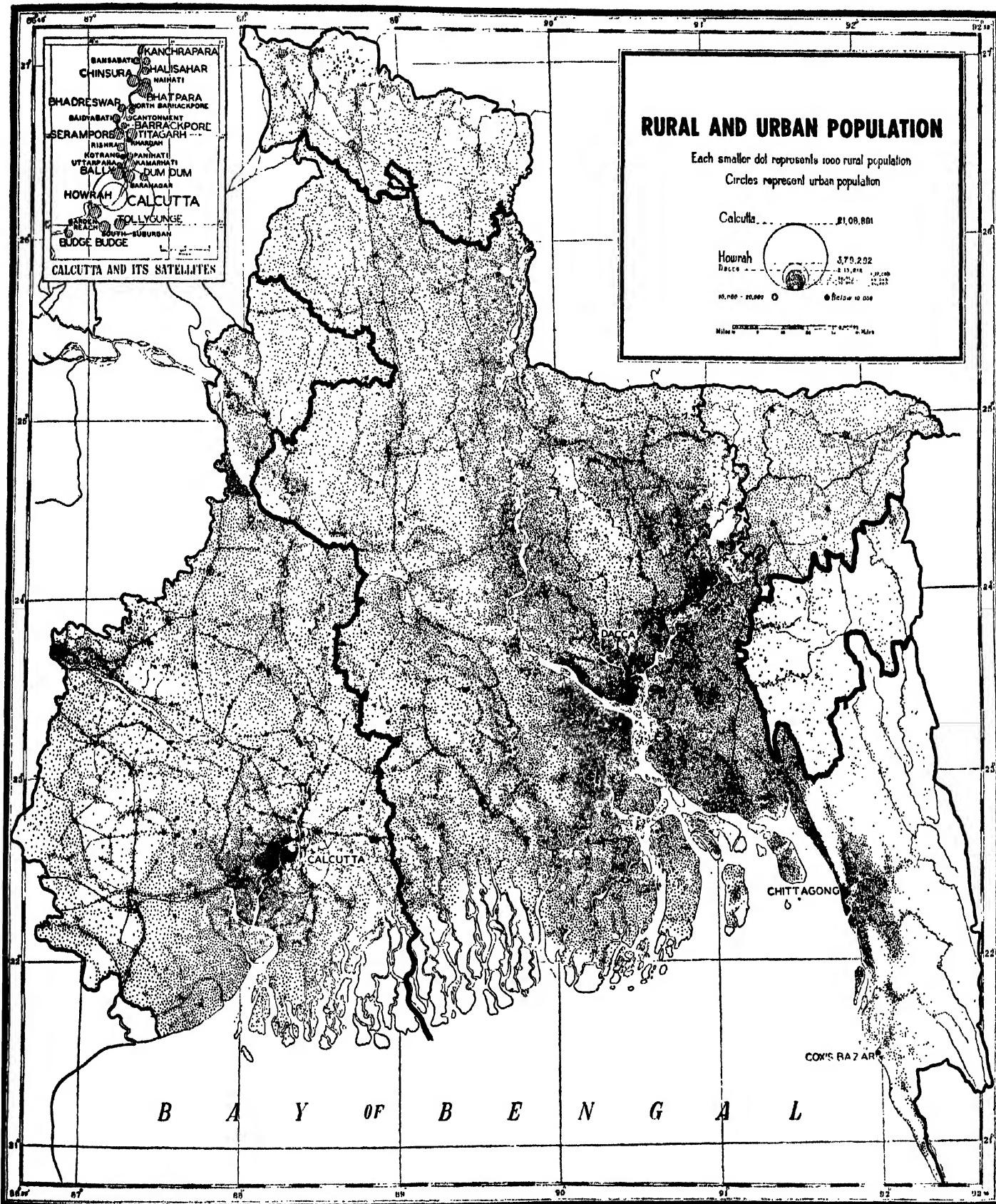
The Bhagirathi-Hooghly river, which runs through industrial towns and highly developed agricultural regions may be taken as the axis of population in West Bengal. It is true that the population is not evenly distributed, to-day, along this axis, due to a very rapid development of its southern part in and around Calcutta. In fact, the Calcutta portion of the axis is perhaps the most densely populated part of the world (42,63,000 people on 470 square miles), the density being over 9,000 to the square mile. If the semi-urban and highly developed rural areas on either side of the belt be added, there will be 75,00,000 people on approximately 3,000 sq. miles, that is, 54 per cent of the population of West Bengal live in and around Calcutta on 13 per cent of the area of the province. Another area of high density lies in the extreme west. This is the coal-mining and industrial region of Raniganj and Asansol. It covers an area of 120 square miles, and has a population of 2,80,751, the density to the square mile being 2,340. In the northern part of the axis there are three zones of high density. Of

these the northernmost extends across the Ganges in Malda district, and is the largest in size. It owes its importance to the Ganges. It has spread out westward, covering the northern tip of the Birbhum district. The other two are located in and around Beldanga and Nabadwip, the former due to the development of brick fields and the sugar industry, and the latter because it is a religious centre for the Vaishnabas.

In West Bengal the western uplands and adjacent low-lying water-logged plains have a prevailing density of population of 300—500 to the square mile. The uplands are well drained, though they suffer from scarcity of water and infertile soils, whereas the adjacent low-lying plains, especially Bishnupur subdivision of Birbhum district and Arambagh subdivision of Hooghly district, are extremely malarious and are often visited by devastating floods.

In the northern part of West Bengal the Mahananda divides the eastern sparsely populated Barind tract from the thickly populated western fertile plains, where silk-rearing and mango-gardening add to the prosperity of the people.

Map 28



HINDUS

MAP 29

This map shows the distribution of Hindus, as enumerated in 1941 census. The number of Hindus was 2,58,01,724. This figure does not include those who lived in Sylhet district, which was then a part of Assam. In divided Bengal their numbers in different political units, not taking into account some 8 lakhs of Hindus who left their ancestral homes in East Bengal and settled in West Bengal immediately after the partition in 1947, should be more or less as follows —

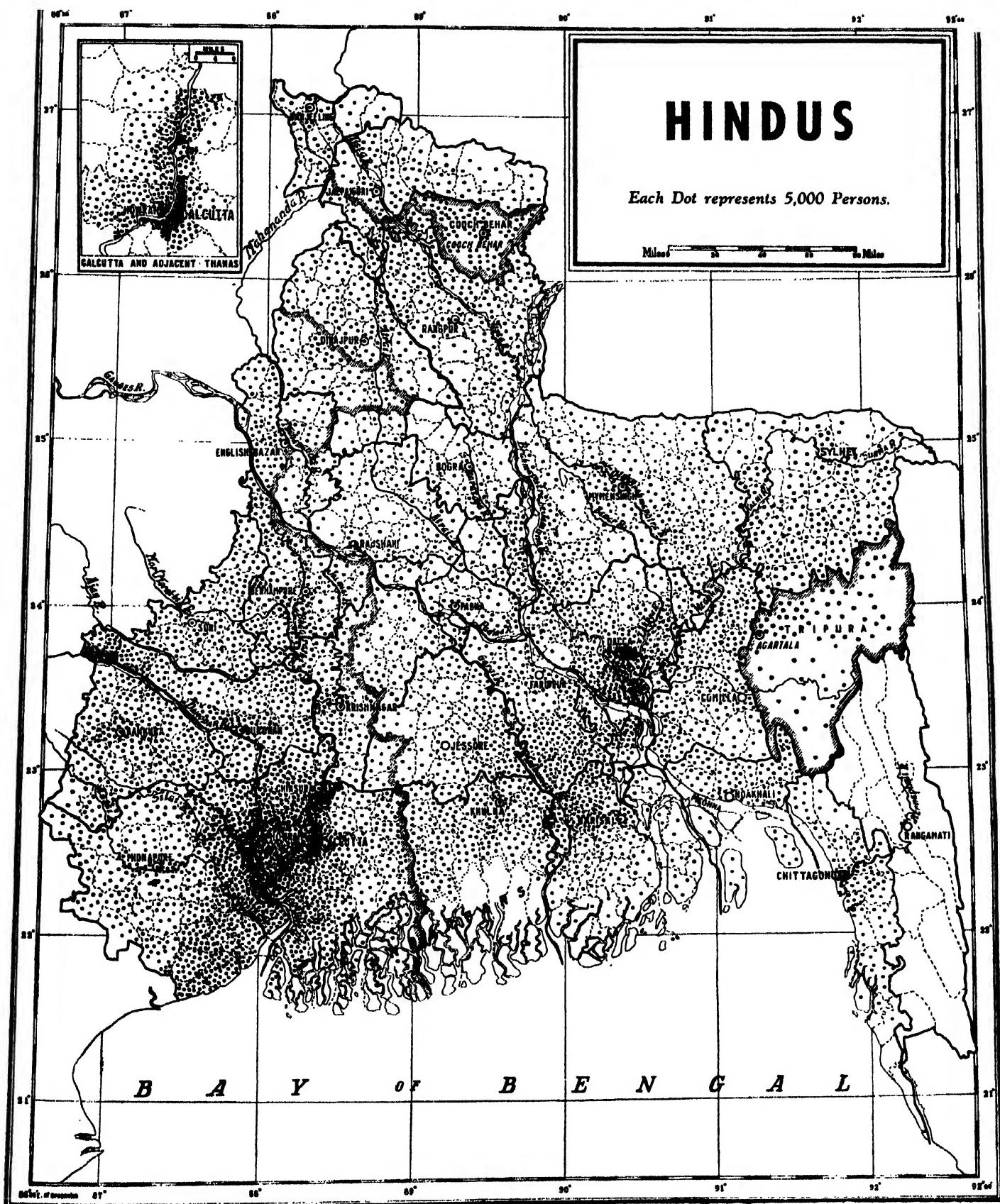
| | Hindus |
|------------------|-------------|
| West Bengal .. | 1,43,31,058 |
| Indian States .. | 7,42,700 |
| East Bengal .. | 1,07,27,966 |

The amalgamation of the greater part of Sylhet district increased the Hindu population of East Bengal by another 10,69,953.

The very fact that the Hindus predominate in West Bengal indicates that they were the first settlers in this part of India, as the eastern part of the delta became habitable only much later. In *Raghuvansha* this fact was noted, and the people of East Bengal were described as boat-dwellers. Another cause of the preponderance of the Hindus in West Bengal is that they prefer to live in urban, or rurban areas, and especially avoid low-lying flood plains, marshy tracts and newly formed islands. Even in East Bengal, where the Hindus form a minority community, they are in a majority in most of East Bengal towns. B. C. Allen, I.C.S., in the Gazetteer on Dacca remarked that 'although the Hindus are numerically inferior to the Muhammadans, they form the bulk of the upper and middle classes, and wealth, learning and influence are largely centred in their hands'. This remark was also applicable to other districts of East Bengal. It is these classes that have been hard hit as a result of the recent partition of Bengal.

The map shows two large concentrations of Hindu population. One such concentration occurs in West Bengal with Calcutta lying near its western fringe. The other concentration occurs in East Bengal, extending from the city of Dacca to the confluence of the Padma and Meghna rivers. The former includes Calcutta and the adjacent industrial areas in the Barrackpore subdivision, the greater parts of the Sadar and Diamond Harbour subdivisions of the district of 24-Parganas, the districts of Howrah and Hooghly and the Contai and Tamluk subdivisions of Midnapore district. This block covers an area of about 4,345 sq. miles, and has a Hindu population of over 65 lakhs, the density of Hindus per square mile being 1,500 (five times as much as for the whole of Bengal). Another concentration, though at present covering a small area, occurs in the Raniganj-Asansol coal-mining and industrial region. In East Bengal the main reason for the concentration of Hindu population in the neighbourhood of Dacca is that here lies the famous pargana of Bikrampur, which was once ruled by Hindu kings, and is still noted for Hindu culture and Sanskrit learning. It covers an area of 400 square miles and has a Hindu population of about 5½ lakhs, the density of Hindu population being as high as 1,353. The two main concentrations in West and East Bengal are connected by a wide belt which covers practically the whole of the habitable parts of Khulna district, the northern part of Barisal district, the southern part of Faridpur district, and the south-eastern part of JESSORE district. The main reasons for the concentration of Hindu population in this tract are historical. It was a stronghold of the Hindu chiefs—the Bara Bhuiyas. This belt, including the Dacca area, covers an area of about 5,680 square miles and has a Hindu population of about 28½ lakhs, the density of Hindus to the square mile being over 500.

Map 29



MUSLIMS

MAP 30

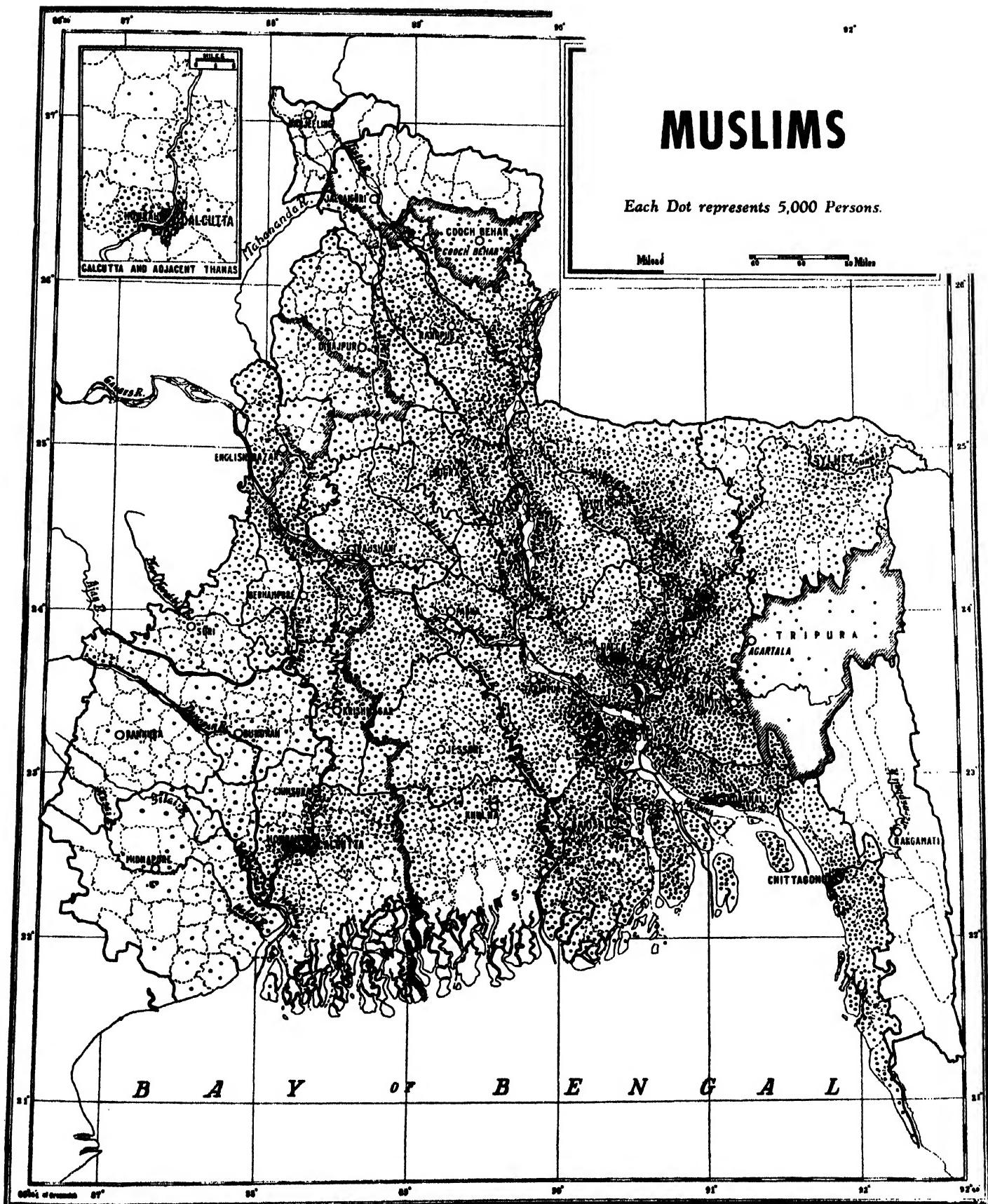
This map shows the distribution of Muslims, as enumerated in 1941. Their number was 3,33,71,689, excluding those who lived in Sylhet district. Their distribution in the present political units should be more or less as given below, not counting the small number of Muslims who have migrated to East Bengal since the partition:—

| | <i>Muslims</i> |
|------------------|----------------|
| East Bengal .. | 2,76,99,739 |
| West Bengal .. | 53,05,696 |
| Indian States .. | 3,66,254 |

The inclusion of the greater part of Sylhet district increased the Muslim population of East Bengal by another 17,34,069. It is only within the last hundred years that Muslims have outnumbered Hindus by a clear majority. Even at the 1881 census the difference in the numbers of Muslims and Hindus was negligible. Immigration in the days of the Muslim rulers might have led to the initial appearance of Muslims in Bengal. But conversions, the conservatism of the Hindus, and the natural fecundity of the Muslims are given as the main reasons for their present number. A glance at the map shows that Muslim settlements follow a definite pattern. They are concentrated mainly along the banks of the active rivers of Bengal. A special class of Muslim cultivators, known as Bhatias, are very good at the reclamation of charlands (newly formed sand islands), and they are very enterprising and migrate readily wherever charlands are formed. This explains the preponderance of Muslims along river banks and in charlands. The dark patches on the map indicating dense Muslim population are especially noticeable (1) along the present Brahmaputra, extending from a little north

of its confluence with the Tista to its confluence with the Hursagar, (2) along the course of the old Brahmaputra, (3) along the Meghna from near Bhairab Bazar to its confluence with the Padma, and throughout its southern reach as far as the sea, (4) along the Arial Khan, (5) along the Padma and the Dhaleswari near their confluences with the Meghna. There are also very large concentrations of Muslim population to the east of the Meghna in Tippera and Noakhali districts and in the southern part of East Bengal lying east of the Madhumati-Haringhata river. The preponderance of Muslims in the Bakarganj district is explained by the fact that this area for long remained very sparsely populated as a result of devastating storm waves and Portuguese raids, and has only been reclaimed gradually in recent years by Muslim immigrants from Dacca and Faridpur. The lighter patches in East Bengal proper prevail in (1) the Madhupur Jungle, (2) the plains lying at the foot of the Garo and Khasi hills in the districts of Mymensingh and Sylhet, (3) the southern undulating lands of Sylhet district, and (4) the marshy tracts along the common border of Mymensingh and Sylhet districts. In the western parts of the present East Bengal the density of Muslims is much less, as clearly indicated on the map. This zone extends from north to south, covering the greater parts of Dinajpur, Rajshahi, Pabna, Nadia, Faridpur, Jessore and Khulna. The map also shows that the uplands, whether Darjeeling Himalayas or the western plateau region or the Chittagong hills, are not inhabited by many Muslims. The main cause of this is that the majority of them, especially the Shaikhs, being farmers, find greater scope for cultivation in the low lying alluvial tracts than in the upland areas where soils are lateritic and gravelly.

Map 30



TRIBAL COMMUNITIES

MAP 31

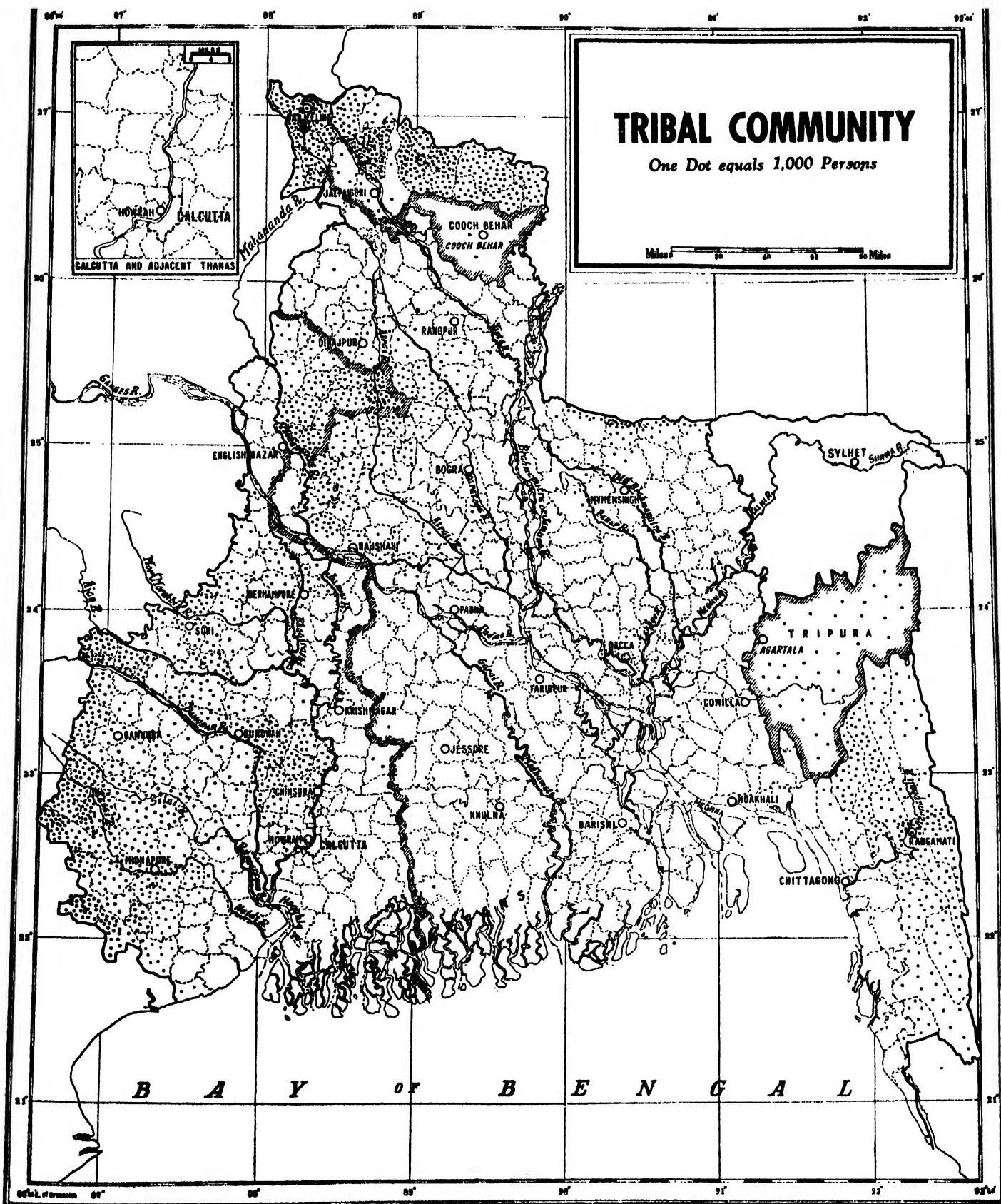
The primitive tribes or naturvolkers numbered 19,25,457 in 1941. They were distributed as follows:—

| | |
|--------------------|-----------|
| West Bengal .. . | 13,68,484 |
| Indian States .. . | 36,068 |
| East Bengal .. . | 5,20,905 |

In West Bengal they are most numerous in the uplands of Midnapore, Bankura, Burdwan and Birbhum. Of the tribes the Santals are by far the most important, and numbered 8,29,025. It is true that they are still under tribal and animistic influence, but they are coming within the fold of Hinduism and some have become Christians. They also immigrated to the plains of Burdwan and Hooghly districts, where the majority of them now profess Hinduism and work on the farms. The Barind jungle area was also opened up with the help of the Santals, where they are now found in large numbers in Malda and West Dinajpur districts. The Oraons (2,40,483) and the Mundas (1,01,479) are the other important tribes. In the Darjeeling mountains hill tribes like Limbus, Mangars, Gurungs, Kamis, Lepchas, Newars, Damais and Bhotias form the substantial proportion of the population. Koch and Mech races are found in the submontane tracts of Jalpaiguri district. There, large numbers of Oraons and Mundas also work in the tea gardens.

In East Bengal about one-half of the primitive tribes are found in the Chittagong Hill Tracts. The rest are found in the northern foothills of Mymensingh district, and in the Barind tracts of Dinajpur and Rajshahi. In the Chittagong Hill Tracts a large number of the so-called primitive tribes, especially the Chakmas have adopted Buddhism as their religion and speak the Bengali language. They should not have been returned as tribes. Besides the Chakmas, the Maghs and the Tipperas are the other important classes returned as tribals. The Chakmas live in central and northern parts of the Chittagong Hill Tracts. The Maghs are found in the southern part. The Tipperas come from the Tripura State, and profess Hinduism. In the northern part of Mymensingh district are to be found Dalus, Doais, Hadis, and Hajongs, all allied to the Garos, who live further north in the Garo hills. There are over 1½ lakhs of Santals in Dinajpur and Rajshahi districts. In Dinajpur district the Santals still tend to be nomadic in their habits and to shift their homesteads frequently. In Rajshahi district, besides Santals, there are some Mundas, and older settlements of Bunas, whose forefathers came to the district to work in the indigo and silk industries.

Map 31



SCHEDED CASTE HINDUS

MAP 32

The British Indian Government coined the unhappy term 'depressed classes', and had the members of those classes *scheded* under the Government of India Act, 1935. Mr. A. E. Porter, i.c.s., Superintendent of 1931 Census Operation, Bengal, wrote in his report "The expression 'depressed classes' is of comparatively recent coinage and in many respects unfortunate. It does not translate any actual vernacular term in common use in Bengal, nor does it describe any class the members of which can be defined with accuracy." Generally speaking, the scheduled castes were those who were educationally and economically the most backward. The number of Hindus specifically so returned in the 1911 census was 75,97,409, and they were distributed in different parts of Bengal as follows:—

| | | | |
|---------------|----|----|-----------|
| West Bengal | .. | .. | 33,13,649 |
| Indian States | .. | .. | 2,18,434 |
| East Bengal | .. | .. | 40,65,321 |

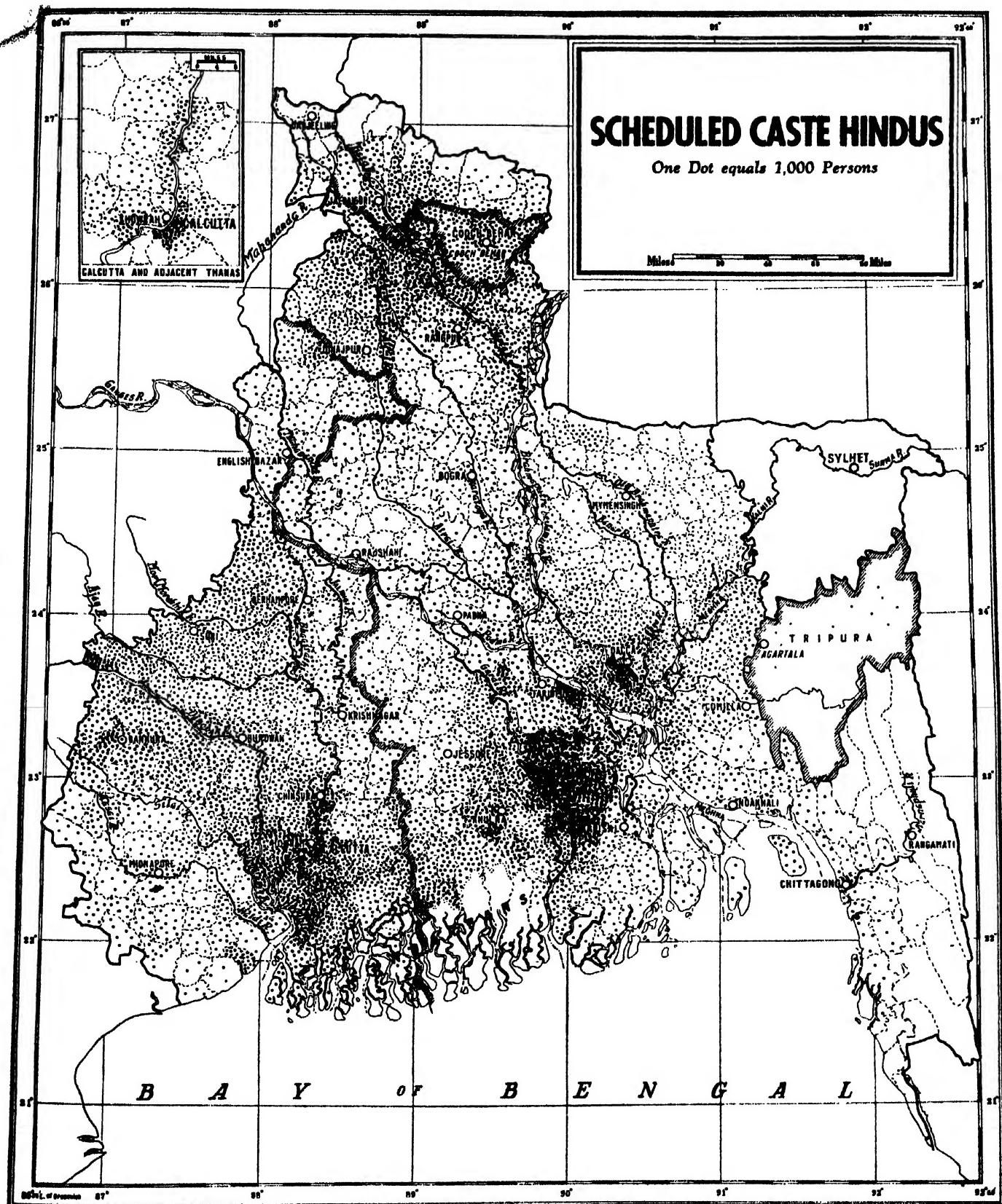
(Many Hindus declined to return their caste and so could not be classified).

In the dense zone of West Bengal there were over 7 lakhs of members of scheduled castes on approximately 1,500 square miles. The majority of them belong to two castes—Pod and Bagdi. The members of both these castes are believed to be the descendants of the original inhabitants of Bengal, and were being gradually brought into the folds of the Aryan settlers in pre-Muslim days. The majority of the Pods (over 50%) have made this part of Bengal their home. They trace their origin from the Aryan poundras and call themselves Brata-kshatriyas. They have contributed mainly to the reclamation of Sundarbans in 24-Parganas and now make their living by cultivation. The Bagdis call themselves Bagra-kshatriyas. They have a good physique and enjoy warlike activities. They make their living by fishing and hunting, and in recent years have taken to cultivation. Their numbers in Birbhum, Bankura and Midnapore districts are still larger (over 5 lakhs in 1931), where they are more evenly distributed. The

Koras (over 90%) are mainly concentrated in this zone. They earn their living as scavengers. The other castes are also functional : Tiyars, the fishermen and boatmen, who inhabit low-lying areas ; Jalia Kaibartas, who are fishermen ; Chamar and Muchis, (tanners and workers in leather) ; Dhobas, (washermen), etc. In the western part of the province Bauris form the second most important scheduled caste. They earn their living by cultivation, and also make excellent manual workers and good domestic servants. In the north of West Bengal, in Jalpaiguri district, the scheduled castes are mainly of aboriginal derivation.

In the dense zone of East Bengal there were over 6 lakhs of scheduled castes on approximately 1,500 square miles. If its peripheral zones be taken into account, there would be another addition of 6 lakhs. Here the majority belong to the sturdy Namasudra caste. In 1931 as many as 15 lakhs were returned as Namasudras from Faridpur, Bakarganj, Dacca, Khulna and Jessore districts. It is often said that the present number of Namasudras, large as it is, is only a fraction of their former number, as a large percentage has dropped off by conversion to Islam. The Namasudras are believed to be the descendants of the original inhabitants of deltaic Bengal. It is mainly with their help that marshy tracts in and outside the Sundarbans can be reclaimed even to-day. They make their living mainly by cultivation and fishing. In Khulna the Namasudras live in the north and east of the district, and the Pods in the south and west. In Jessore the Namasudras inhabit the low-lying tracts of Magura and Narail ; and in Tippera district they live in the northern marshy tract of Brahmanbaria. Besides Namasudras, the Pods are also found in large numbers in Khulna district (about 2 lakhs), and Jalia Kaibartas, in Jessore district. The Jalia Kaibartas also form a substantial proportion of the scheduled castes in Mymensingh, Dacca, Tippera and Chittagong districts. In the north the Paliyas and the Namasudras predominate in Dinajpur and Rangpur districts respectively.

Map 32



MINORITIES IN WEST AND EAST BENGAL, 1941

MAP 33

This map shows the distribution of Muslims in West Bengal and non-Muslims in East Bengal. The population figures on either side of the Radcliffe Line are expressed as a percentage of the total population in each thana. In the case of the two States—Cooch Behar and Tripura, which have joined the Indian Union, the entire State is taken as a unit and therefore the map does not show any variation of Muslim population within the States. The map brings out clearly the following features as a result of the Radcliffe Award :

1. In West Bengal the Muslim-predominating thanas (over 50 per cent of Muslims) occupy an area of 3,781 sq. miles. This area has been shaded on the map by vertical columns with white streaks. In East Bengal on the other hand, the non-Muslim majority thanas, shaded on the map by dark horizontal columns with white streaks (excluding the Sundarban portions of the four non-Muslim predominating thanas of Khulna district—Shyamnagar, Paikgacha, Dacope and Rampal, and also excluding the 47 non-Muslim majority towns) cover an area of 9,741 square miles, more than 2½ times the size of the Muslim predominating area in West Bengal. It is also clear from the map that the East Bengal thanas, where non-Muslims form a substantial proportion of the population (over 30%) cover a still larger area than that of the West Bengal thanas, where Muslims form a substantial proportion of the population.

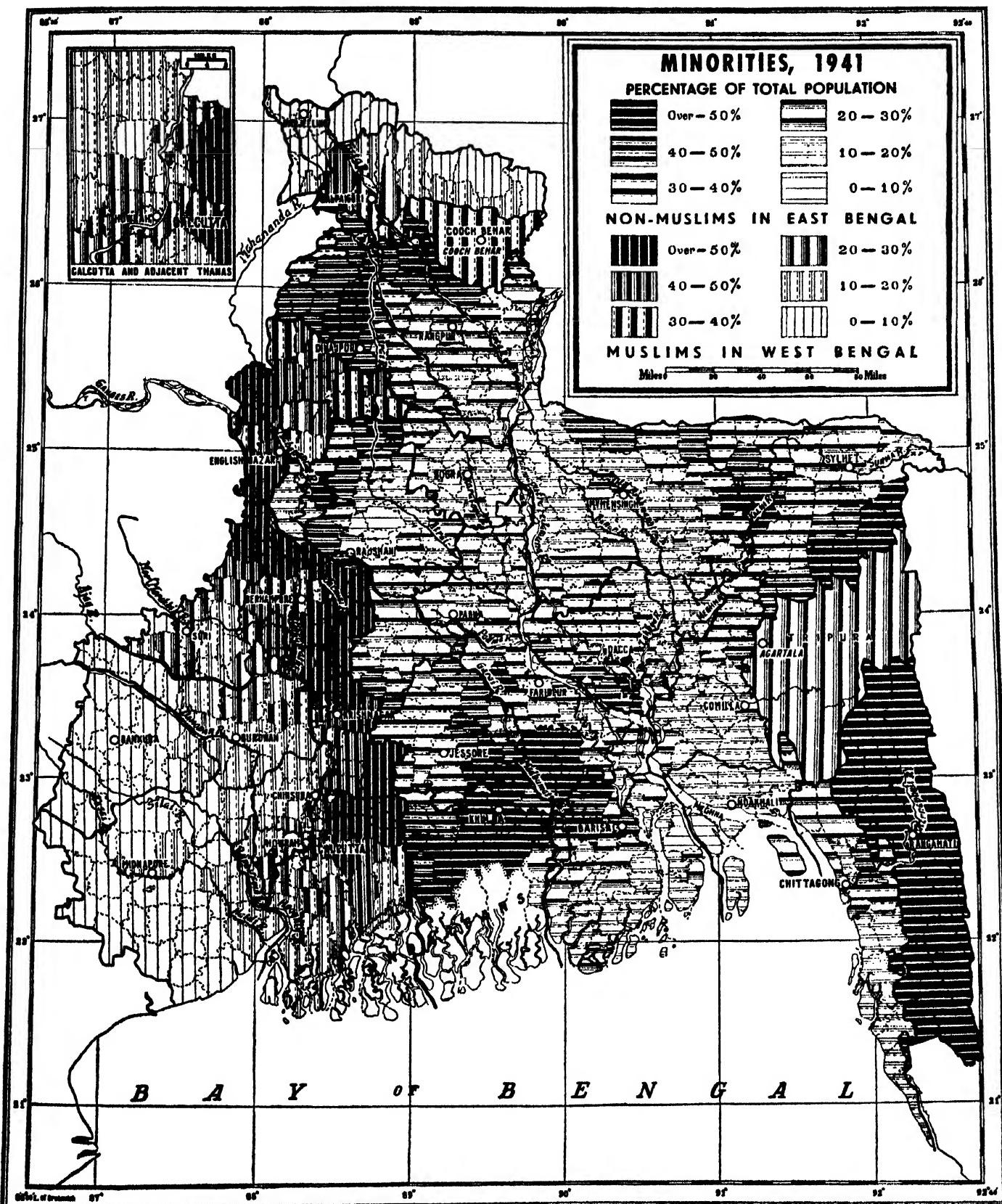
2. The Muslim population of the Muslim-predominating areas in West Bengal amounted to 17,42,564, whereas the non-Muslim population of the non-Muslim predominating areas in East Bengal amounted to 25,84,062. If the non-Muslim population of the non-Muslim majority towns of East Bengal be added, the

non-Muslim population of non-Muslim predominating areas will increase by another 5,36,298.

3. The Muslim-predominating areas excepting one—the Harischandapur-Kharba-Ratua area of Malda—extend from north to south along the frontier line. If the question of the transference of population arises in future, it will just be a crossing over the border. The non-Muslim predominating areas in East Bengal, on the other hand, extend eastward, far away from the common frontier, making the problems of transference more difficult.

In West Bengal the thanas with sparse Muslim population (less than 10%) extend over a wide area in the districts of Burdwan, Bankura and Midnapore. In East Bengal, on the other hand, there are six isolated areas with sparse non-Muslim population. The northernmost of these occurs in the border region between Rangpur and Mymensingh districts, through which flows the Brahmaputra. It comprises four thanas (Rahumari in Rangpur; Dewanganj, Islampur and Melandaha in Mymensingh), and covers an area of 491 square miles. A little to the south occurs the second region on the right bank of the Jamuna in the districts of Pabna and Bogra (Kazipur and Dhunot). This covers an area of 227 square miles. The third region covering an area of 96 square miles lies not very far from the confluence of the Padma and Meghna on the Faridpur side. Next, comes the region comprising the two islands bordering on the Shabazpur Channel of the Meghna (Daulatkhan in Barisal, and Ramgati in Noakhali). Of the two remaining areas, one occurs in the Bogra district (Kahalu—93 square miles) and the other in the Rajshahi district comprising the thanas of Mohanpur, Durgapur and Bagmara (291 square miles).

Map 33



MINORITIES IN WEST AND EAST BENGAL, 1941

MAP 34

This map shows in another form the distribution of minorities in West and East Bengal. The density to the square mile of non-Muslim population in East Bengal and of Muslim population in West Bengal has been indicated. In East Bengal high densities of non-Muslim population form one compact block, covering an area of 8,631 square miles. That block is the home of 41,80,139 non-Muslims. It covers the following areas :—

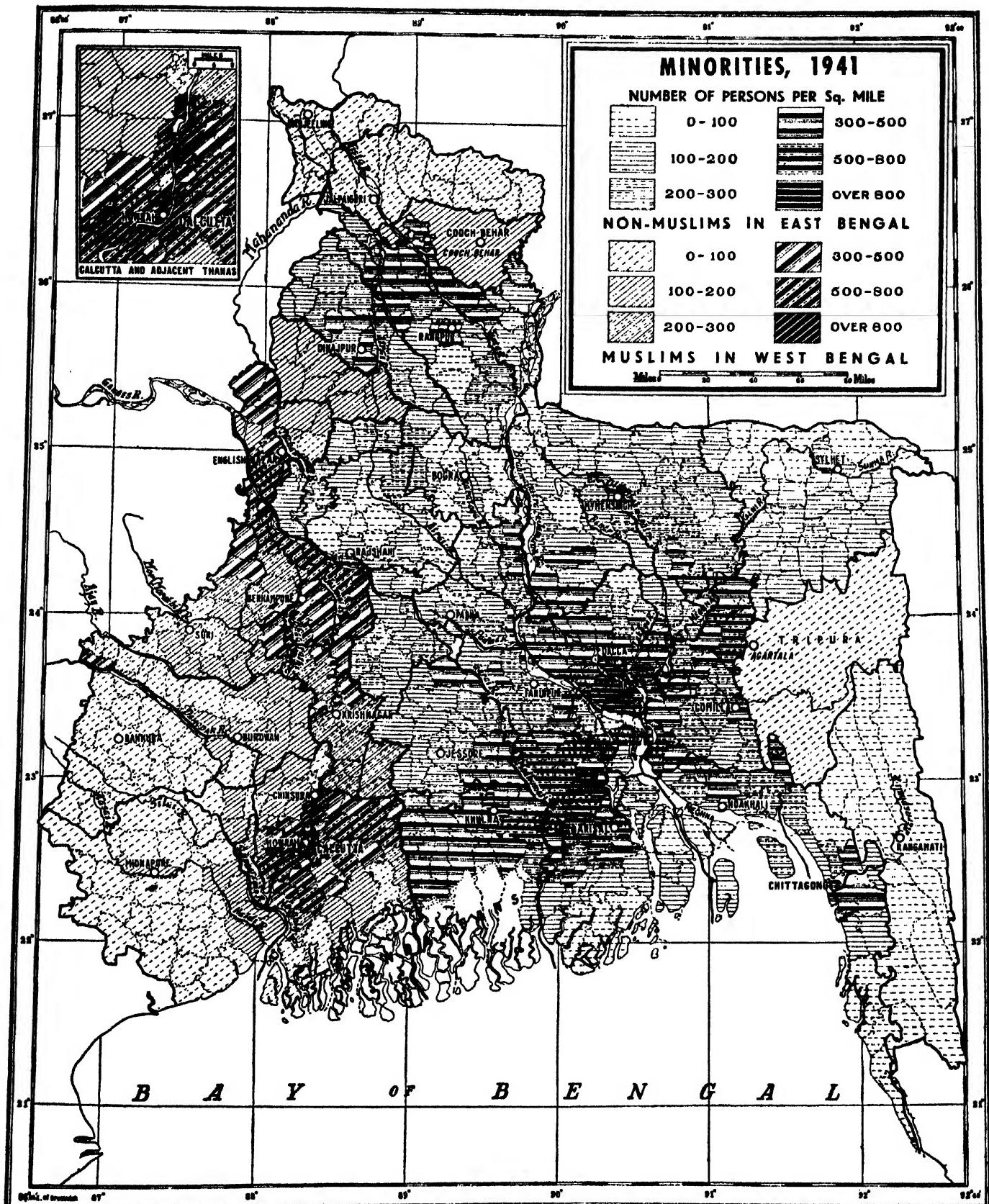
- (1) the whole of Khulna district except the Sundarbans and a small area in the north-west (8,65,284 non-Muslims on 1,980 sq. miles); (2) the south-eastern portion of Jessore district between the Bhairab and Madhumati (2,12,712 non-Muslims on 476 sq. miles); (3) the whole of the Gopalganj sub-division and its prolongation up the Arial Khan and the Padma in Faridpur district (7,12,706 non-Muslims on 1,429 sq. miles); (4) across the Padma the whole of the Munshiganj sub-division and the greater parts of Manickganj, Narayanganj and Sadar sub-divisions of Dacca district (12,00,682 non-Muslims on 1,783 sq. miles); (5) two prolongations in Kishorganj and Tangail sub-divisions of Mymensingh district (3,47,179 non-Muslims on 905 sq. miles); (6) across the present Brahmaputra a small area in Pabna district (1,11,204 non-Muslims on 278 sq. miles); (7) across the Meghna the whole of the Brahmanbaria sub-division and its southward extension along the river in Tippera district (6,13,607 non-Muslims on 1,447 sq. miles); (8) a small prolongation south-east in Noakhali district (1,16,765 non-Muslims on 336 sq. miles).

There are six other outliers with a high density of non-Muslim population in different parts of East Bengal, covering an area of 2,281 sq. miles and having a non-Muslim population of 9,81,278. Of these, the largest occurs

in the north of the province in Rangpur, Dinajpur and Jalpaiguri districts (3,92,581 non-Muslims on 1,064 sq. miles). The block of high density in Chittagong district covers an area of 442 sq. miles, and has a non-Muslim population of 2,70,162. Not very far from the main Khulna-Dacca block occur the remaining four outliers. The map also shows clearly the areas with a low density of non-Muslim population, mainly in Rajshahi and Bogra districts.

In West Bengal there are two areas with a high density of Muslim population, both of them lying along the frontier. Of these two, the southern one is more densely populated. This is the industrial region of Bengal, which contains Calcutta, the biggest city of India. It covers an area of 2,008 square miles and has a Muslim population of 17,01,033. The component parts of this block are the following : (1) Calcutta (4,97,535 Muslims on 37 sq. miles); (2) the industrial Barrackpore sub-division and the agricultural Barasat sub-division, the greater part of Basirhat sub-division and the northern parts of the Sadar and Diamond Harbour sub-divisions of the district of 24-Parganas (8,98,972 Muslims on 1,552 sq. miles); (3) across the Hooghly river the greater part of the Howrah district (2,46,178 Muslims on 320 sq. miles) and the industrial area of the Hooghly district (58,384 Muslims on 99 sq. miles). The northern block extends from the north of Malda district to near Krishnagar and has two small prolongations westward, one in Birbhum district, and the other across the Bhagirathi in Kandi and Bharatpur. This block covers an area of 3,206 sq. miles, and has a Muslim population of 17,01,033. The areas with low densities of Muslim population cover a very large area, mainly in Bankura and Midnapore districts and also in the western parts of Burdwan and Birbhum districts.

Map 34



FOUR IMPORTANT HINDU CASTES AND BUDDHISTS

The four maps on this page show the geographical distribution of four important Hindu Castes, based on 1931 census figures and of Buddhists, based on 1941 census.

MAP 35

The Bráhmanas of Bengal represent one of the best types in modern culture and education, and in social position they perhaps stand first. The majority of them belong to either of the two sects, the Rádhis and Várendras. They numbered 14,47,691 in 1931, that is, 6·5 per cent of the total Hindu population, and formed the fifth largest Hindu caste in the province. The map shows that about 65 per cent of the Bráhmanas live in the present West Bengal province, and the rest in East Bengal. In the former province they are most numerous along the banks of the Bhagirathi, and in the centre of Bankura district. The preponderance of Bengali Bráhmanas in the latter area may be due to the generosity of the Bishnupur Rajas. The Raj family of Nadia is also noted for its patronage of Bráhmanas, and hence there is a preponderance of Bráhmanas in the neighbourhood of Krishnagar.

MAP 36

The Káyasthas along with the Bráhmanas form the upper class of Bengali Hindu Society. It can very well be said that Bengal is pre-eminently the land of Káyasthas since no other province in India can compare with Bengal as regards the number and importance of the Káyastha community. They numbered 15,58,475 in 1931. The map shows that unlike the Bráhmanas, the vast majority of the Káyasthas live in the present province of East Bengal (75%). Their greatest numbers are found in Chittagong, Mymensingh, Dacca, Bakarganj and Tippera districts. In West Bengal they are found mainly in the city of Calcutta.

MAP 37

The Rajbangshis or Rajbangshi Kshatriyas as they call themselves, claim to have the same origin as the ruling house of Cooch Behar. They make their living by cultivation and are mainly confined to Cooch Behar and North Bengal districts—Jalpaiguri, Rangpur, and Dinajpur. The map shows that the present partition of Bengal has affected them most. They numbered 18,06,391 in 1931, and by virtue of their numbers they take first place among the Hindu castes of North Bengal.

MAP 38

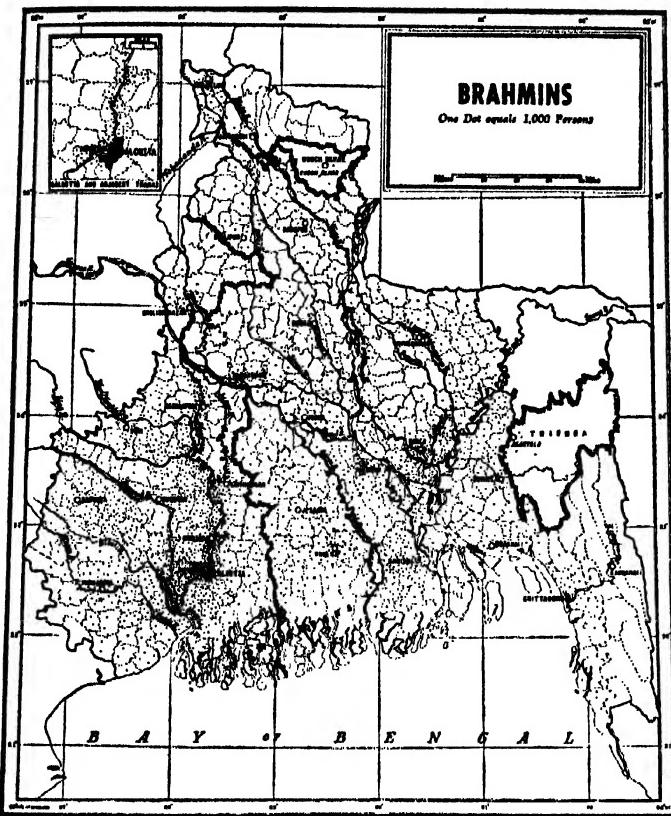
The Mahisyas and the Buddhists. The distribution of the Mahisyas and the Buddhists have been shown on the same map. The Mahisyas or Chasi Kaivartas are the most numerous Hindu caste in Bengal. They numbered 23,81,266 in 1931, and are mainly concentrated in the southern part of the present province of West Bengal. They prefer to live along the banks of rivers and sea coasts, and avoid swampy areas. They make good cultivators and sailors, and a large number of them have taken to the learned professions.

The Buddhists numbered 1,54,285 in 1941. They were distributed in the different parts of Bengal as follows :

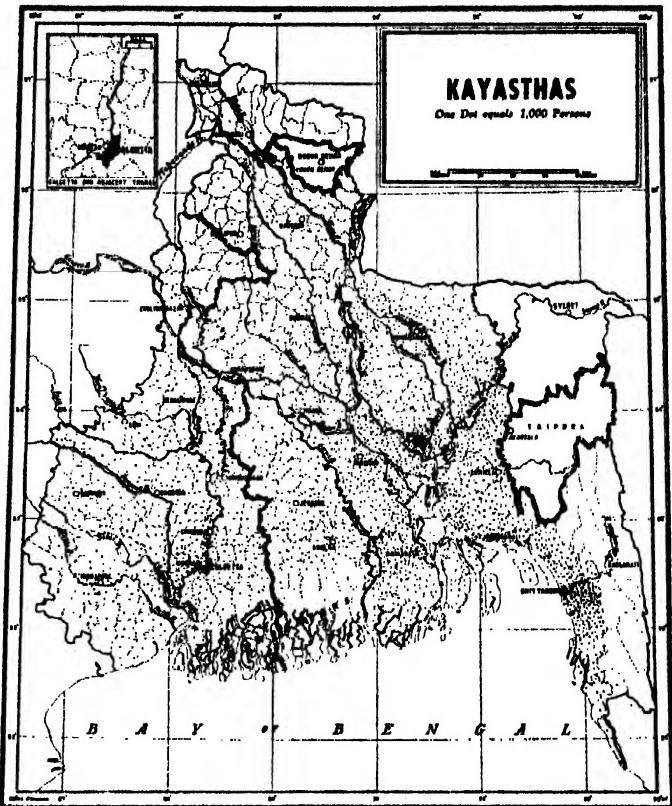
| | | | |
|------------------|----|----|--------|
| West Bengal .. | .. | .. | 49,149 |
| Indian States .. | .. | .. | 7,725 |
| East Bengal .. | .. | .. | 97,411 |

It may be pointed out that a large number of Buddhists in Darjeeling and Chittagong Hill Tracts were returned as tribals in 1941 census. In West Bengal they were confined mainly to Darjeeling district (80%), and speak Tibeto-Burman dialects. In East Bengal they are confined to Chittagong district (81%). There, they are concentrated in two places (1) in the Cox's Bazar sub-division and in the hilly parts in the east of the district, and (2) in the plains of Patiya and Boalkhali. In the former area are to be found the Arakanese Maghs, and in the latter the most advanced and cultured Buddhists, the Baruas.

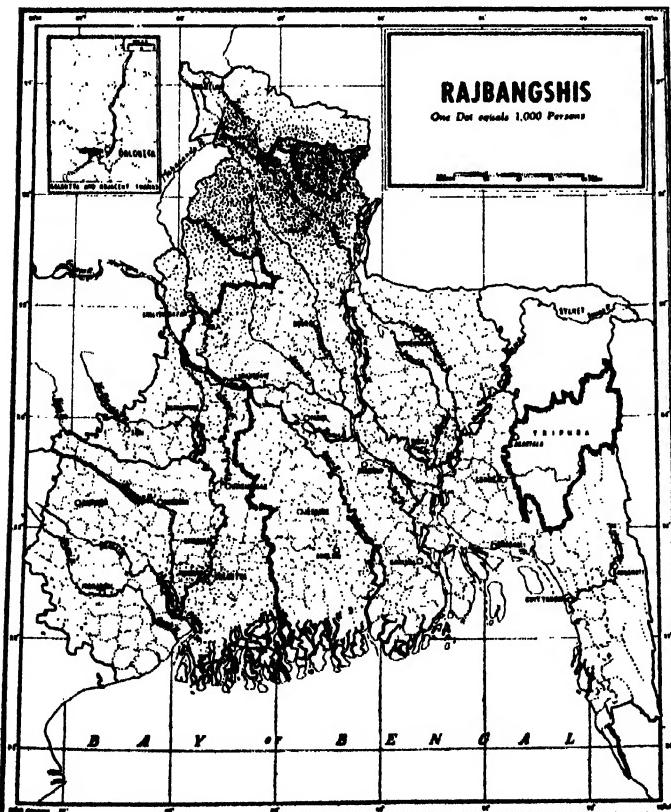
Map 35



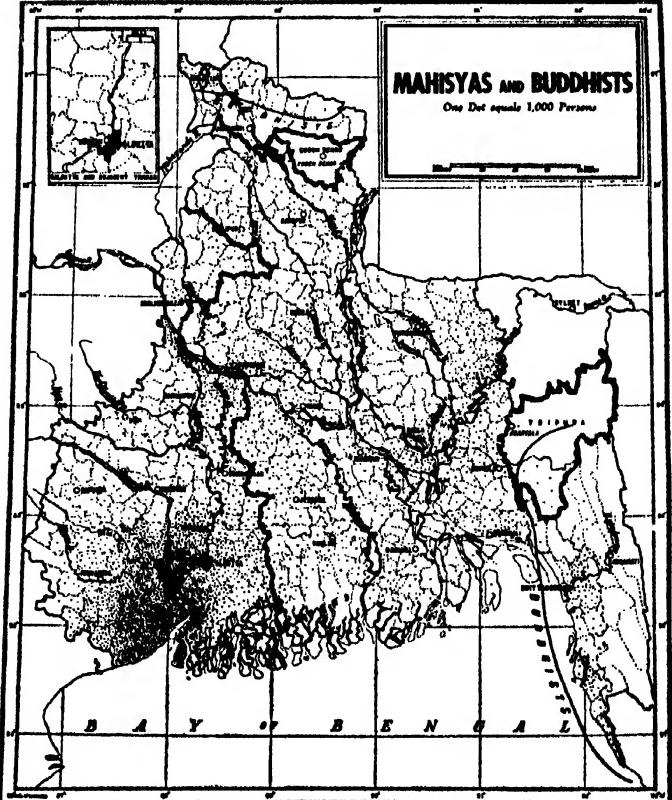
Map 36



Map 37



Map 38



PEOPLE DEPENDENT ON LAND

The first map of this series indicates the distribution of persons engaged in agriculture and fishing. The three others indicate the distribution of the three main classes of agricultural population, who actually till the land. As the 1941 census returns do not give detailed figures, these maps are based on the 1931 census figures.

MAP 39

TENANT FARMERS

Out of a total of 1,47,04,079 workers in Bengal there were as many as 1,00,88,1 farmers and fishermen (69%). Since agriculture is the main occupation of the vast majority of the people of Bengal, this map shows more or less the same pattern as that showing the density of population. The greatest concentration of farmers and fishermen is to be found in the eastern part of East Bengal stretching from the banks of the Brahmaputra and Garai-Madhumati to the eastern borders of Tippera and Chittagong districts. Another concentration occurs in the south of the present province of West Bengal. The density of farmers and fishermen in the central and northern areas of dead and dying rivers and in the western drier upland areas, is considerably less. The Sundarbans and the eastern hills have the least numbers of persons engaged in the exploitation of vegetation and animals.

In the land laws of Bengal the term landowner has no definite meaning. According to 1931 census instructions, land-owning farmers and tenant farmers were defined as those who, irrespective of their status in the land tenure system under the Bengal Tenancy Act, cultivated their land either personally or by means of hired labour, and paid rent in cash or kind to zamindars, talukdars etc. The distinction between a land-owning farmer and a tenant farmer was that the former had permanent or semi-permanent rights.

MAP 40

LAND-OWNING FARMERS

In Bengal more than one-half of the agricultural population were land-owning farmers. Their proportions were, however, much higher in typical East Bengal districts (Tippera, 78% ; Dacca, 74% ; Mymensingh, 68%) than in typical West Bengal districts (Burdwan, 40% ; Hooghly, 32% ; Bankura, 30%). In West Bengal it was only in Midnapur that the percentage was over 50. In the two tea-growing districts - Darjeeling (13%) and Jalpaiguri (17%) the percentage was the lowest.

MAP 41

TENANTS FARMERS

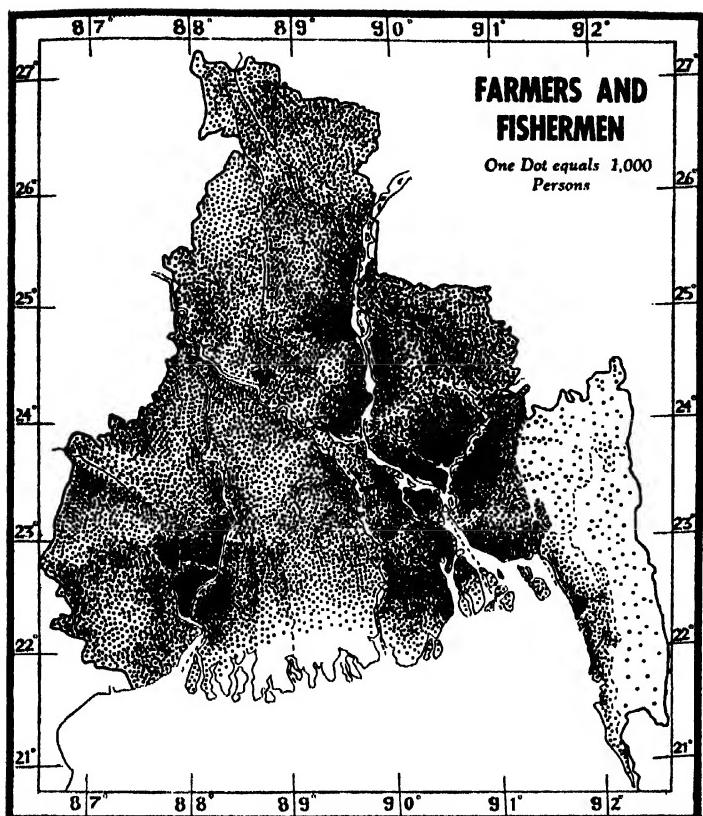
In Bengal the number of tenant farmers was less than one-sixth of that of land-owning farmers. The percentage was, however, higher in the industrial districts in West Bengal, and in the charlands of East Bengal, especially in Rangpur district.

MAP 42

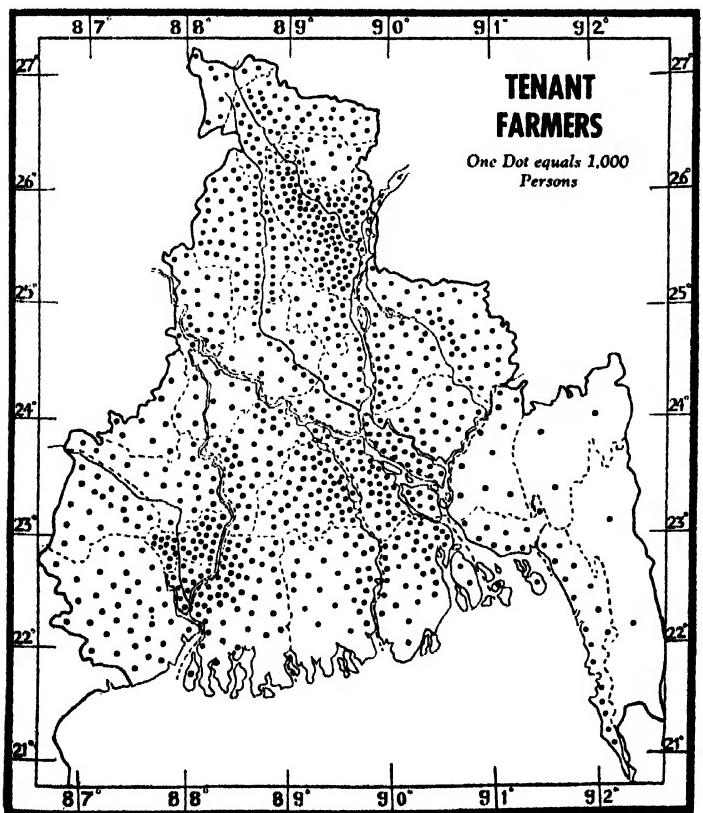
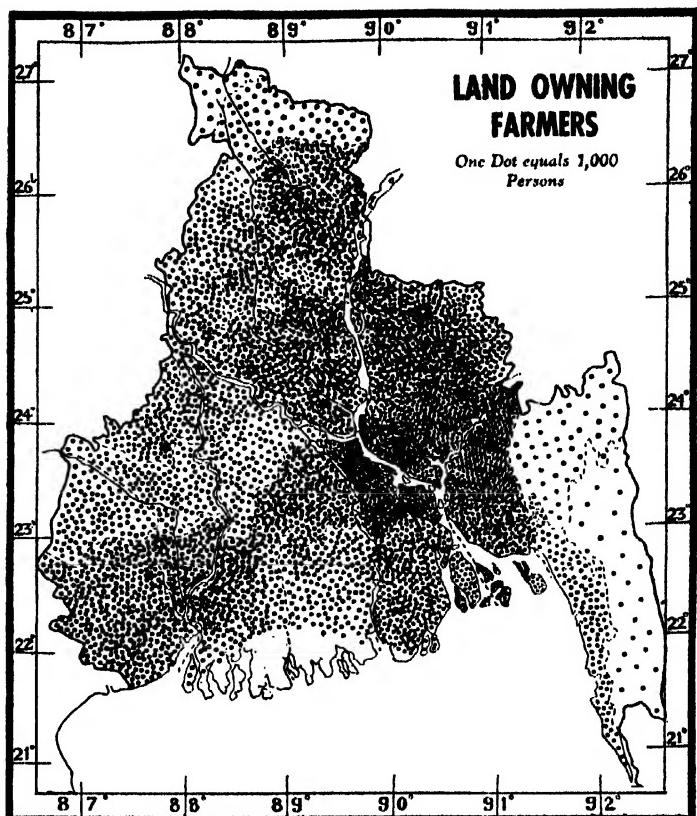
AGRICULTURAL LABOUR

In Bengal, for every two land-owning farmers there was one farm worker. But the proportion was much higher in West Bengal than in East Bengal. Of the total farm workers, about one-half are concentrated in the much smaller province of West Bengal. It may, however, be pointed out that the demand for agricultural labour is highly seasonal. The busiest months of the agricultural year are from Baisakh (mid-April to mid-May) to Bhadra (mid-August to mid-September), when the farm workers move from place to place in search of work. In the harvesting time (November, December), which occurs on different days at different places, the movement of agricultural workers is still more striking.

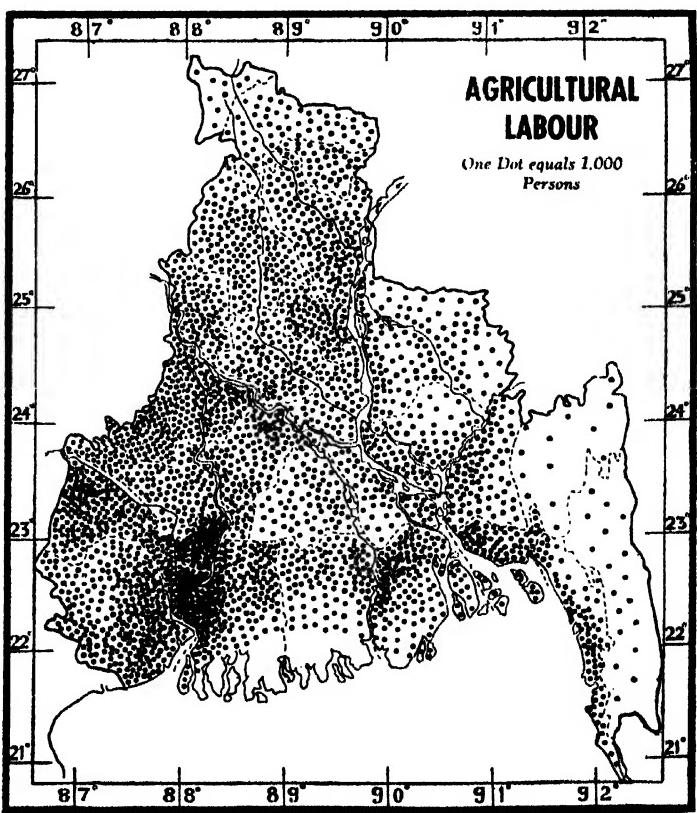
Map 39



Map 40



Map 41



Map 42

ARABLE LAND

MAP 43

This map shows the distribution of arable land (net cropped land) as a percentage of total land in each thana of West and East Bengal. The total acreage of such arable land amounted to 30,650,371 in 1944-45. It was distributed in the two parts of Bengal as follows:

| | | |
|-------------|----|------------------|
| West Bengal | .. | 11,434,011 acres |
| East Bengal | .. | 19,216,330 acres |

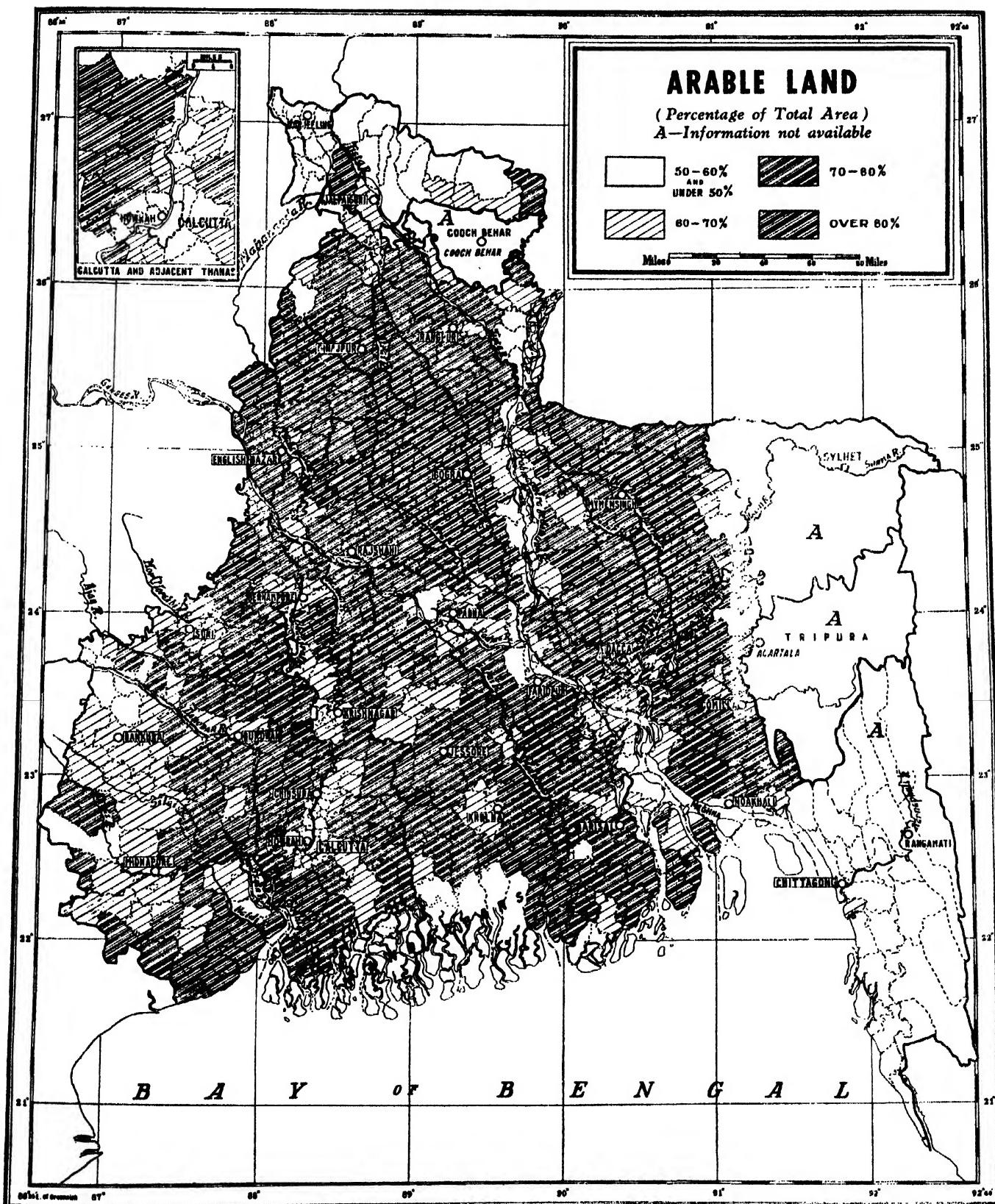
In West Bengal, arable land formed 63.3 per cent of the total area of the province, and in East Bengal, 61.2 per cent of the newly formed Eastern Pakistan, excluding Sylhet district and Chittagong Hill Tracts.

In West Bengal, the heavily forested and hilly districts in the north—Darjeeling (28.2%) and Jalpaiguri (12.9%)—have the least area under the plough. The western plateau region with lateritic soils is also poor in arable land. The river banks of the Hooghly-Bhagirathi, though agriculturally very productive, are highly urbanized, and are therefore indicated by lighter shades on the map. The tracts with a high percentage

of arable land form a more or less continuous block extending from West Dinajpur and Malda to the mouths of the Hooghly river.

In East Bengal the low percentage of Khulna district (39.7) is due to the Sundarbans forests. The hilly and forested Chittagong district is also unshaded (43.8%). The Brahmaputra, Padma, and Meghna rivers have innumerable newly-formed sandy chars, which are mainly responsible for lowering the percentage of arable land in thanas bordering on these rivers. Elsewhere in this province, the darker shades prevail. Of the areas with extensive cultivation, one lies between the Brahmaputra and the Padma, covering practically the whole of the Bogra district and considerable areas of adjacent districts of Dinajpur, Rangpur, Rajshahi and Pabna. The other area follows first the course of the old Brahmaputra, then the Meghna up to its confluence with the combined waters of the Brahmaputra and Padma, and finally it extends southward, covering the eastern part of the district of Tippera.

Map 43



TWICE CROPPED LAND

MAP 44

This map shows the distribution of land producing more than one crop. The total area of such land amounted to 8,250,751 acres in 1944-45, that is, only about 27 per cent of the net cropped land of the two parts of Bengal. Its distribution was as follows:

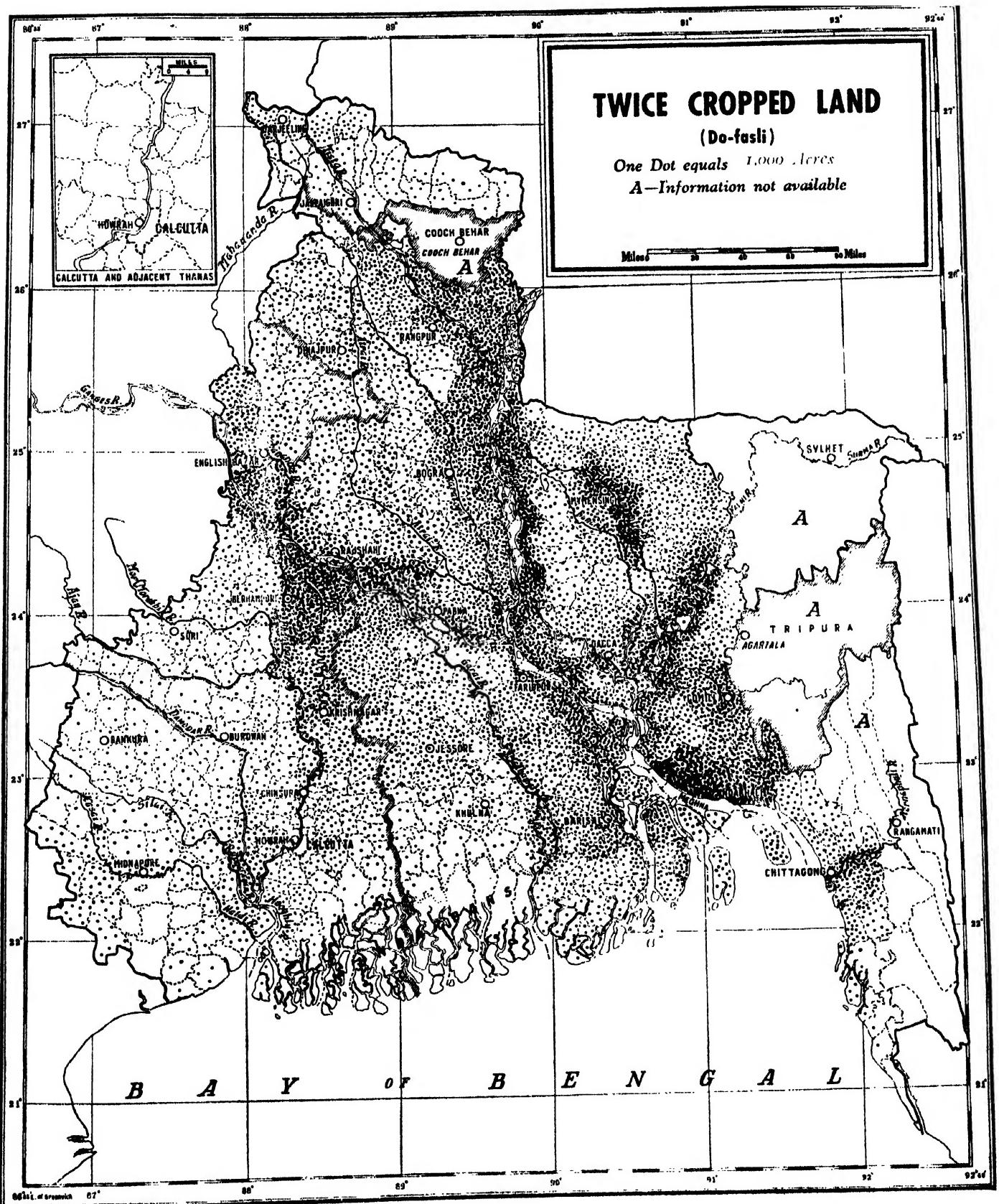
| | |
|----------------|-----------------|
| West Bengal .. | 1,683,828 acres |
| East Bengal .. | 6,566,923 acres |

In West Bengal land is, therefore, not as fully utilized as in East Bengal, only 14.7% of the net cropped land producing more than one crop, (as against 34.2 per cent in East Bengal). The distribution of this type of land is far from uniform within the province. A narrow belt, watered by the Ganges, Mahananda and Bhagirathi rivers in the districts of Malda, Murshidabad and Nadia has the largest proportion of such land, about one-half of the total. This region is rich in varied types of agricultural products—rice, wheat, barley, maize, pulses, sugar-cane and mango. The greater part of the area lying west of the Bhagirathi-Hooghly produces at present only one crop—aman rice, because of infertile soils and water scarcity. A comparison of the two maps

showing arable and do-fasli land indicates that except in parts of Malda and Murshidabad districts, intensive cultivation is not practised where the extensive type prevails.

In East Bengal, this is all the more true. There, a large concentration of twice-cropped land occurs on river banks, not extensively cultivated. All the great rivers—the Brahmaputra, the Meghna and the Padma—flow through intensively cultivated tracts, annually enriching them with silts. This zone of intensive cultivation is the widest near the confluence of the Meghna and Padma. Away from the rivers, especially in the Bogra and adjacent districts where over 80 per cent of the land is under the plough, it is seldom that more than one crop is obtained from the land. The Meghna river basin is the only exception; here both extensive and intensive types of cultivation are practised. The red earths areas—Barind and Madhupur in the north, and the region with defective drainage in Jessore and Khulna districts have the least area of land producing more than one crop in East Bengal.

Map 44



CULTURABLE WASTE LAND

MAP 45

This map shows the extent of land in different parts of Bengal that can yet be brought under the plough. It may, however, be pointed out that only a very small proportion of the so-called culturable waste land can be so utilized, as culturable waste includes fallow land, grassland, woodland and built-up areas. Moreover, in certain parts of Bengal a kind of reed (Khari) grows on such land, which is used as a support for betel vine creeper, and is economically more paying than crops. Besides, Bengal farmers, through their long experience, know their land so intimately that when they stop cultivating a piece of land they do so for definite reasons. The total acreage of cultivable waste land amounted to 4,399,834 in 1944-45. Its distribution in the two parts of Bengal was as follows :

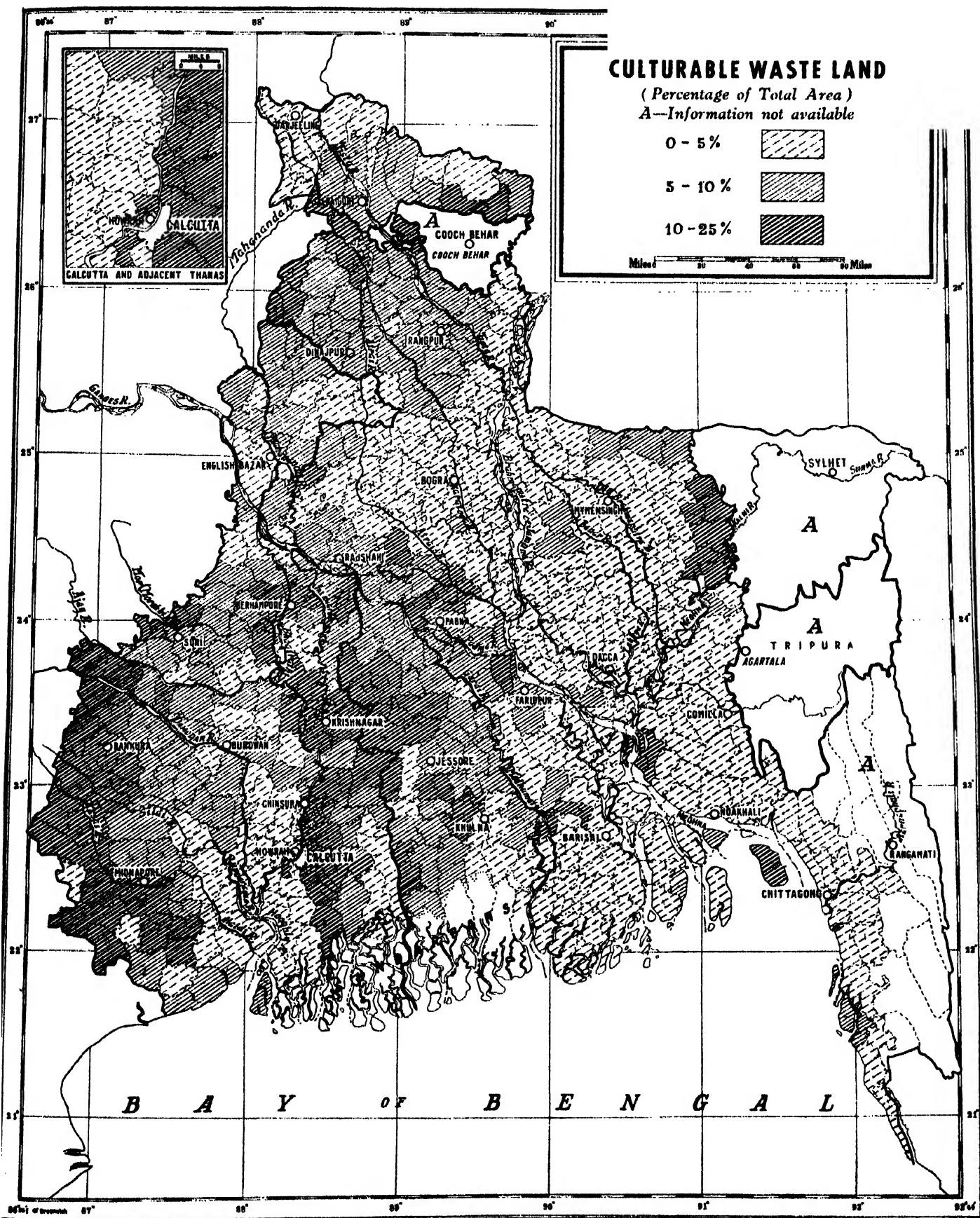
| | |
|-------------|---------------------|
| West Bengal | ... 2,025,376 acres |
| East Bengal | ... 2,374,458 acres |

In West Bengal, the proportion of so-called culturable waste land is somewhat higher (11.2% of total land and 17.7% of net cropped land) than in East Bengal (7.5% of total land and 12.4% of the net cropped land). It is the highest in the western part of the province, extending from the Raniganj coal-mining area almost to the sea coast through Bankura and Midnapore districts. This is the area of deficient rain-

fall and torrential streams, and where damage done to soils by erosion has been considerable. The strip of land between the Bhagirathi and the eastern border of the province has also a large percentage of culturable waste land, because of the preponderance of built-up areas on the banks of this river and consequent interference of drainage channels, formerly entering the Bhagirathi from the east. The scope for immediate extension of cultivation in Howrah and Hooghly districts, and in the Rupnarayan and Haldi river valleys in Midnapore district is considerably less. The same is true in the greater part of areas lying north of the Ganges, including the mountainous district of Darjeeling.

In East Bengal there are two tracts, widely separated, where some scope for extension of cultivation still exists. It is the greatest in the western parts of Kushtia, Jessore and Khulna districts, the typical region of dead and dying rivers. In the north, the diversion of the Tista eastward has deprived the agricultural land of a steady supply of water and fertilising silts; hence the proportion of cultivable waste land has been steadily increasing. Elsewhere, marshy tracts, as in Pabna and Mymensingh, are responsible for the high percentage of cultivable waste land.

Map 45



UTILISATION OF CULTURABLE WASTELAND

In Bengal productive uncultivated lands belong to one of the following categories : woodland, grassland, and land containing bamboo groves or mango orchards.

MAP 46

FOREST AND WOODLAND

The dark patches on the map represent reserved and protected forests. Their distribution in 1917, according to the information supplied by the Department of Forestry, Bengal, were as follows :

| | |
|----------------|-----------------|
| West Bengal .. | 16,97,611 acres |
| East Bengal .. | 50,86,909 .. |

In West Bengal the reserved and protected forests occur in Darjeeling and Jalpaiguri districts in the north, and in the Sundarbans of 24-Parganas in the south. The sal (*Shorea robusta*), the tun (*Cedrela toona*), khair (*Acacia catechu*) and sissu (*Dalbergia sissoo*) are the important timber trees in the former forest. The principal timber trees in the latter forest are garan (*Ceriops candolleana*), geoa (*Excoecaria agallocha*) and keora (*Sonneratia apetala*). In East Bengal extensive forests occur in the Chittagong Hill Tracts, and Chittagong and Khulna districts. The valuable timber trees in the first two districts are the jarul (*Lagerstroemia flos regiae*), tun (*Cedrela toona*), gamhar (*Gmelina arborea*), chaplas (*Artocarpus chaplasha*), gurjan (*Dipterocarpus turbinatus*), and nigeswar (*Mesua ferrea*). The Khulna Sundarbans contain the same valuable timber trees as their counter part in 24-Parganas.

Besides these forests, there are private forests and thickets or shrubberies of semi-spontaneous growth and more or less useful trees in the neighbourhood of the villages. Their acreages in the two Bengals were as follows in 1914-15 :

| | |
|----------------|----------------|
| West Bengal .. | 2,68,190 acres |
| East Bengal .. | 3,86,713 .. |

Among common trees are the following : red cotton tree (*Bombax malabaricum*), jack-fruit tree (*Artocarpus integrifolia*), Jam (*Eugenia jambolana*), and *Zizyphus jujuba*. In East Bengal the Madhupur Jungle is covered with a dense growth of tall trees overrun with creepers. In West Bengal, on the other hand, the low hills along the border of the province are still covered at places with dense tree vegetation.

MAP 47

GRASSLAND

In Bengal the farmers seldom grow fodder crops but feed their cattle on paddy straw and natural grasses in the pasture land. The area of grassland amounted to 324,212 acres in 1914-15, hopelessly inadequate for grazing the entire cattle population. Its distribution in the two parts of Bengal was as follows :

| | |
|----------------|---------------|
| West Bengal .. | 126,705 acres |
| East Bengal .. | 197,507 .. |

In West Bengal, the Terai and Western Duars in the Darjeeling and Jalpaiguri districts have a large acreage under grasses. The commonest of the grasses are *Imperata cylindrica* and *Andropogon aciculatus*. Parts of Midnapore and Burdwan districts also contain pasture land.

In East Bengal grassland is more unevenly distributed. The upper sandy reaches of the Tangan and Atrai, the Madhupur Jungle, the clayey marshes along the eastern borders of Mymensingh, and northern part of Tippera, the sandy coasts of Barisal, and especially Hatia, the island on the mouth of the Meghna, contain practically the whole of the grassland.

MAP 48

MANGO ORCHARDS

The area shown under woodland does include mango orchards of inferior quality. But acreage under better types of mango trees is shown separately. It amounted to 317,869 acres in 1914-15.

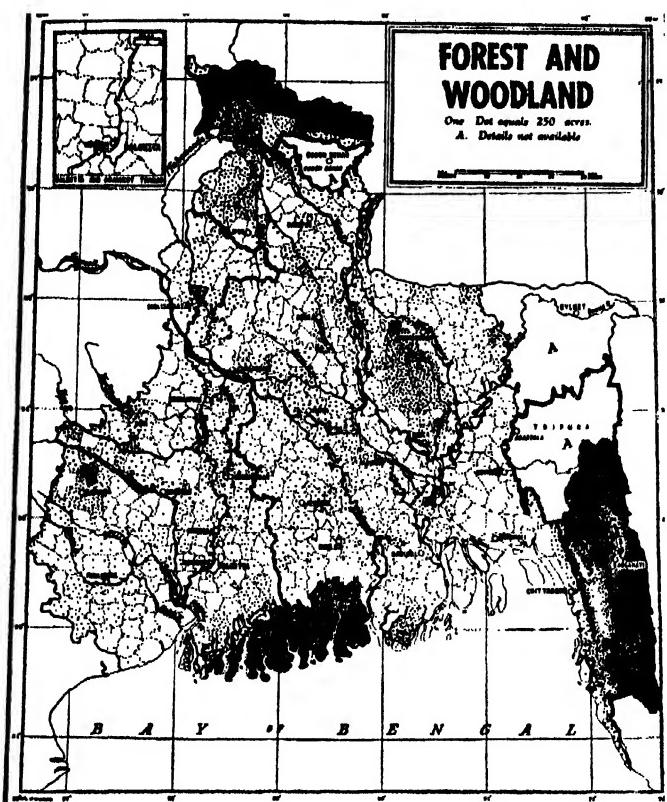
| | |
|----------------|---------------|
| West Bengal .. | 186,513 acres |
| East Bengal .. | 131,356 .. |

In West Bengal the districts of Malda and Murshidabad are noted for excellent mangoes, where this king of fruits is grown on a commercial scale. The dark patch on the map round English Bazar is very striking. Another area of fairly intensive cultivation occurs in the neighbourhood of the densely populated Calcutta industrial region.

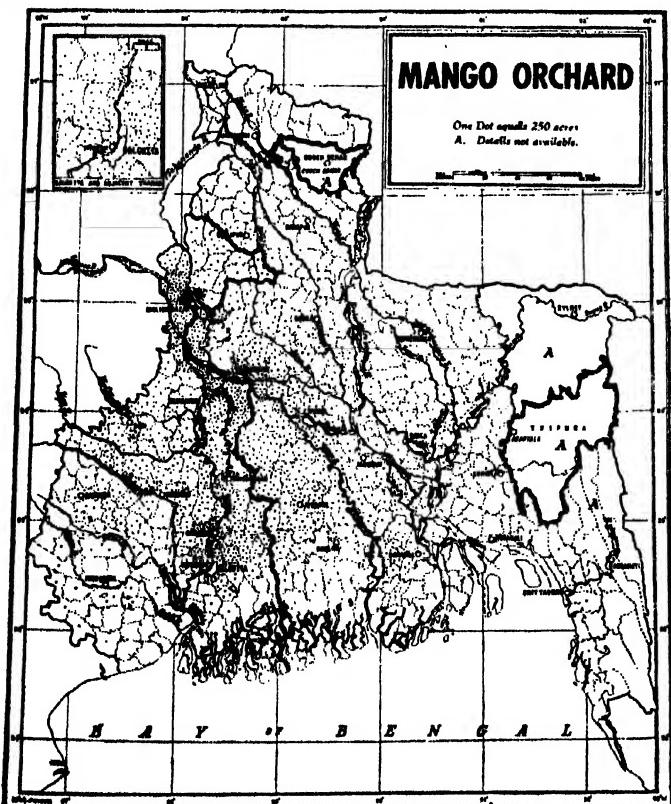
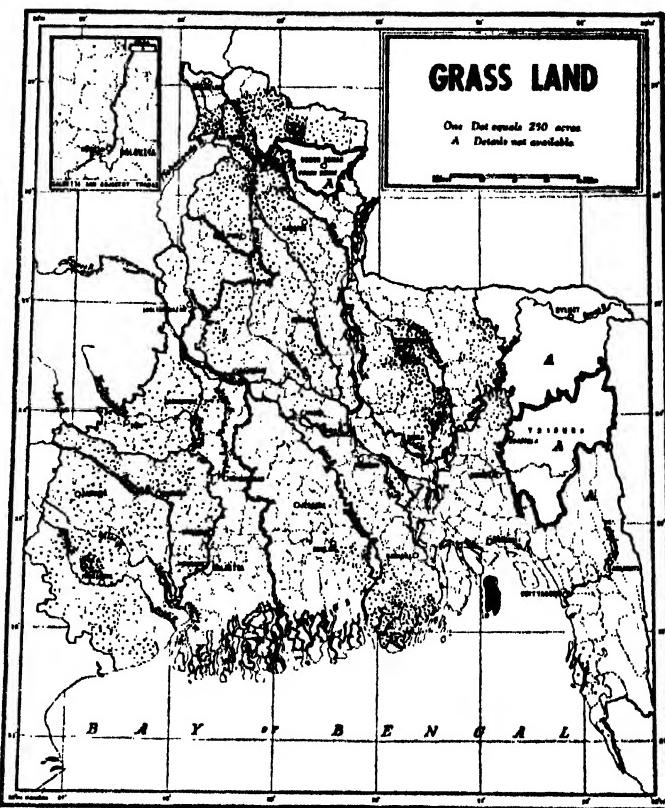
In East Bengal mangoes are grown only in the western part of the province. The absence of mango trees in typical East Bengal districts is due to excessive rains and the consequent prevalence of the mango weevil.

(Continued on page 66)

Map 46

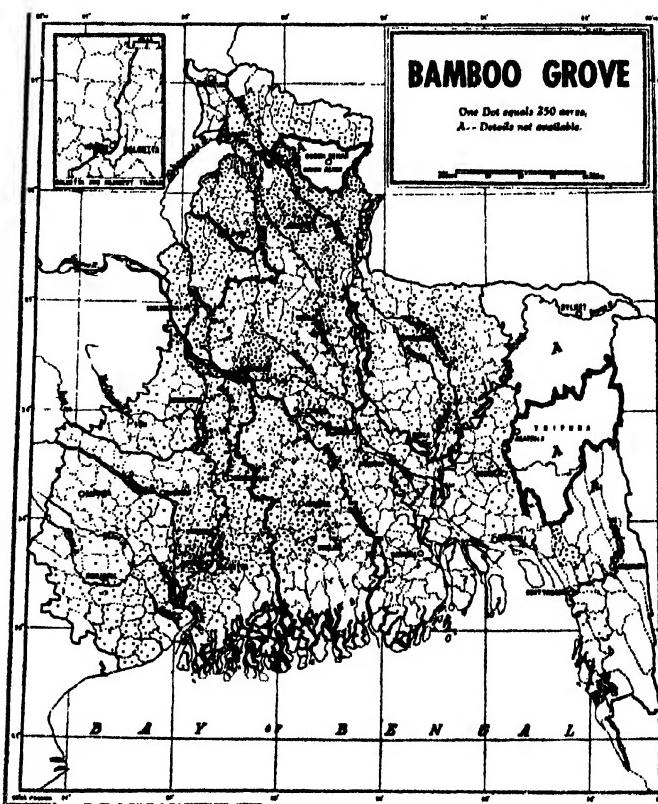


Map 47



Map 48

65



Map 49

LAND UNDER RICE

MAP 50

This map shows the distribution of rice-growing land expressed as a percentage of the total arable land in each thana. The high percentages indicate that rice is by far the most important crop in Bengal, and where the percentage is over 100 it means that more than one crop of rice is raised annually from the same piece of land. The relative importance of rice is even greater than is suggested by the percentage distribution, (which of course by itself is an imposing figure practically everywhere). The reasons are that (1) rice is the staff of life of the people of Bengal; (2) rice straw provides food for cattle; (3) rice gives a higher return than most other crops. The total area under all the varieties of rice (some 500 in all) was 27,930,420 acres in 1944-45.

In West Bengal the total production of rice on 9,287,114 acres of land amounted to 111,445,568 maunds. This province, therefore, cannot be self-sufficient even in a normal year, per capita deficiency being about 10 seers on the basis of 1941 population and 6 maunds of annual consumption per head. The sparsely populated mountainous and submontane tracts in the north have the least acreage under rice, but the climatic and topographical conditions favour the cultivation of other cereal crops. Most of the other areas with higher shades—Malda, parts of Murshidabad, Nadia and Bankura—do not have a large proportion of rice-growing land because of relief, limited water

supply and infertile soils, but each of these areas produces enough rice for local consumption. The real deficiency is in the industrial districts—Howrah, Hooghly and 24-Parganas, including Calcutta—the per capita shortage being as much as 3 maunds and 10 seers. West Dinajpur produces the maximum (12 maunds, 21 seers per capita). Birbhum, Burdwan and Midnapore are normally surplus districts.

In East Bengal the total production of rice on 18,643,312 acres of land amounted to 223,719,744 maunds. There should not ordinarily be a shortage of rice in the province, per capita surplus being 1 maund and 4 seers on the same basis of calculation as in West Bengal. Rice is intensively cultivated in the inundated areas of the Brahmaputra, the vast area between the Madhumati and the Arial Khan with Barisal as centre, and east of the Meghna. In these tracts the percentage of rice-growing land is over 100, two crops and in some cases three crops being raised from the same plot of land. The Madhupur Jungle is the only area in East Bengal where sufficient rice is not grown. The percentage is also relatively smaller in the centre of the Rajshahi district, but this district as a whole produces almost twice its local requirements. Dacca, with its mainly industrial population, is the only district that is deficient in rice in East Bengal. Every other district has an exportable surplus in a normal year.

UTILISATION OF CULTURABLE WASTE LAND

Continued from page 64

MAP 49

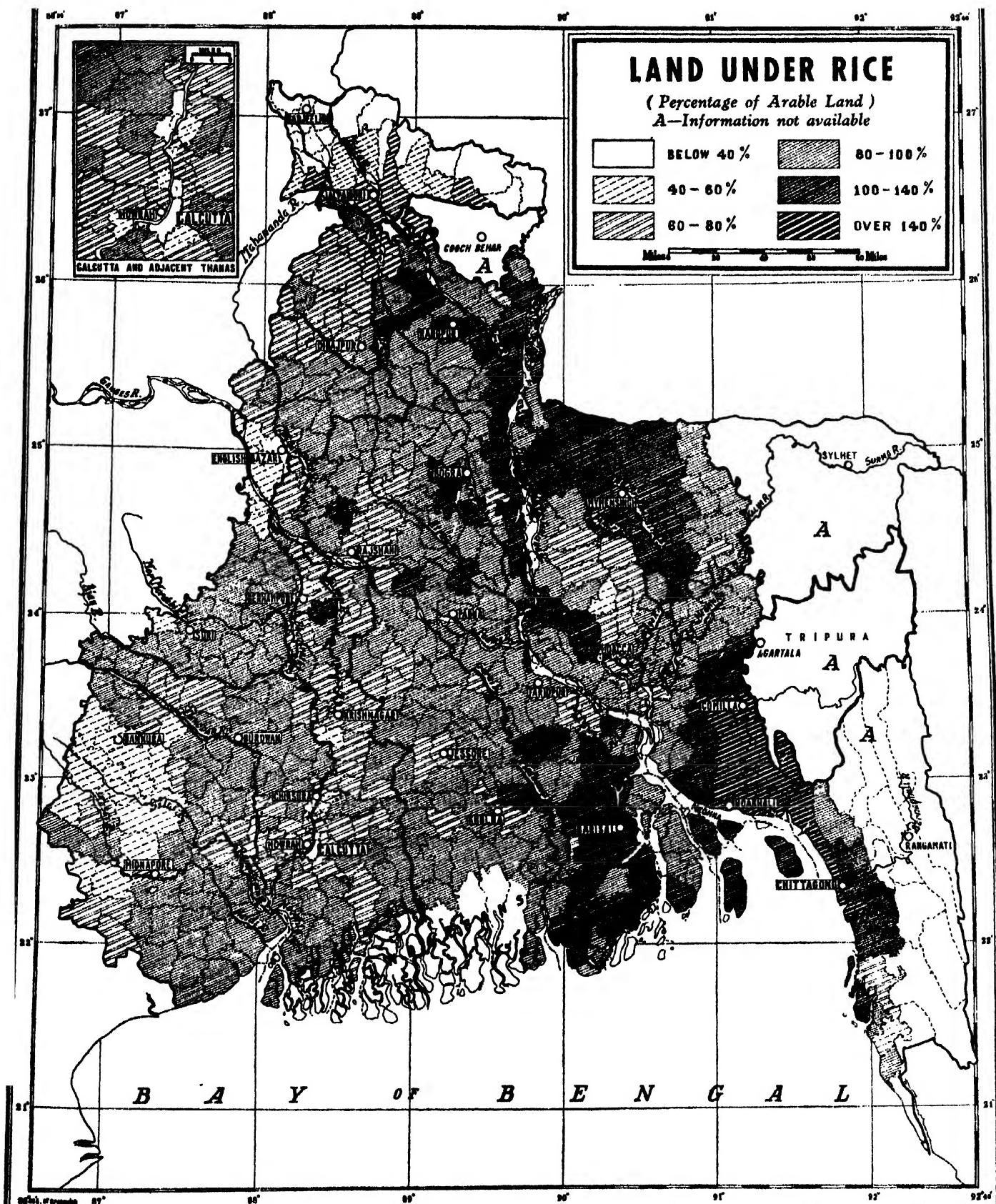
BAMBOO GROVES

Almost every village and every homestead has its bamboo clump. The bamboos do not require any care or attention. Once planted they grow spontaneously. The Chittagong Hill Tracts are the real home of the best quality of bamboo, *Melocanna bambusoides*; here it is gregarious and covers a large area, but for want of information these areas could not be shown on the map. Many millions of culms are exported annually from Chittagong. *Bambusa tulda* is the most common bamboo

of the southern part of Bengal. The total area under bamboo groves was 436,290 acres, distributed as follows :
West Bengal . . . 145,196 acres
East Bengal . . . 291,092 " (excluding Chittagong Hill Tracts).

In West Bengal it is only in recent years that the Raniganj paper mills have been experimenting with bamboos and sabai grass on some uplands owned by the Bengal Coal Company.

Map 50



AMAN RICE

MAP 51

Bengal rice is divided under three main classes—aman (winter rice), aus (summer rice) and boro (spring rice). The determining factor whether aman, aus or boro is to be cultivated is the availability of water. Since aman is cultivated under deep water conditions, low-lying tracts holding water till about October are suitable for its cultivation. This condition is realised practically everywhere with or without the aid of irrigation; and the low earthen dams (*ails*) built around each small plot of field are an expression of the need to retain water for aman rice. The distribution of rainfall also determines the method of cultivation—transplanting or broadcasting, the former always giving a higher yield and better quality. The importance of aman rice can be realised from the fact that out of 28 million acres under rice, as much as 21 million are aman land. The total acreage under aman amounted to 20,823,890 in 1944-45, distributed in the two parts as follows :

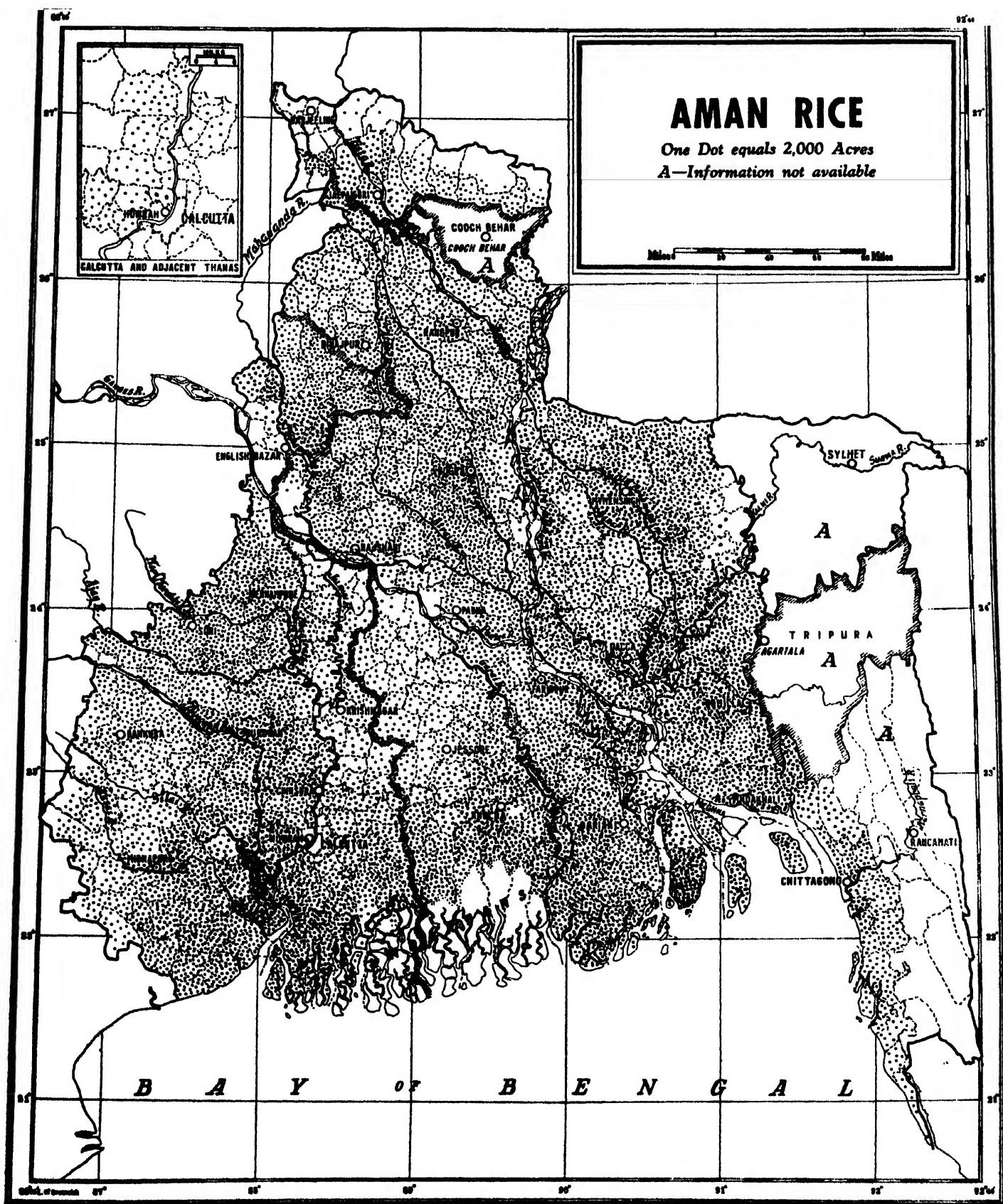
| | |
|----------------|-----------------|
| West Bengal .. | 7,790,555 acres |
| East Bengal .. | 13,033,335 .. |

In *West Bengal* the southern part comprising the districts of 24-Parganas and Midnapore, has over one-third of the total acreage under aman. West of the Bhagirathi the density of aman land is fairly high, due to the elaborate arrangement for catching and retaining rain water in ricefields. West Dinajpur and the northern low-lying area in Malda have also a high density. The region of low density extends from a little north of English Bazar to a little south of the southern boundary of Nadia district. The main reasons

for the smaller proportion of aman land in this tract are that transplanting cannot be resorted to because of the relatively high level of the ground, want of sufficient early rainfall, and the danger of the delicate plants being killed by the late floods. The scrub forest lands of Midnapore, Bankura and Burdwan districts also have a low density of aman land.

In *East Bengal* Nadia district has the lowest area under aman rice for the same reasons as in the West Bengal portions of this district. More or less the same conditions account for the smaller production of aman land in Jessore district, and parts of Malda (west of the Mahananda), the northern bank of the Padma in Rajshahi and Pabna districts and the tract in between the Karatoya and Brahmaputra rivers in Bogra and Pabna districts. Mymensingh (especially the eastern half) and Tippera districts in the north account for one-fifth of aman land. There, long-stemmed aman is grown in those low-lying tracts where 5 to 15 feet of water accumulate during the rains. This variety of aman plant can keep pace with the rising of the flood to a remarkable degree and has been known to shoot up to 20 feet or so at a rate of 12 inches per day. Another one-fifth of aman land is found in Khulna and Barisal districts in the south, originally covered by Sundarban forests and subsequently reclaimed. Barisal is famous for 'balam' rice, named after the balam country-boats in which it used to be exported. The high lands in the Madhupur jungle and elsewhere are suitable for growing aman of the transplanted type.

Map 51



AUS RICE

MAP 52

Aus (Ashu in Sanskrit) literally means early, that is to say, this variety of rice flowers sooner and is ready for harvest earlier than aman. It is easier to cultivate as it is practically everywhere broadcast, requires less labour and provides a second chance for another crop. In spite of these favourable points aus rice is not cultivated widely for the following reasons: it does not survive more than $2\frac{1}{2}$ feet of standing water in the field and hence cannot ordinarily be grown in low-lying tracts; its quality is coarser and its yield lower, and it therefore does not ordinarily enter the market but is consumed by the farmers. The total acreage under aus rice was 6,550,265 in 1944-45, distributed in the two parts of Bengal as follows:

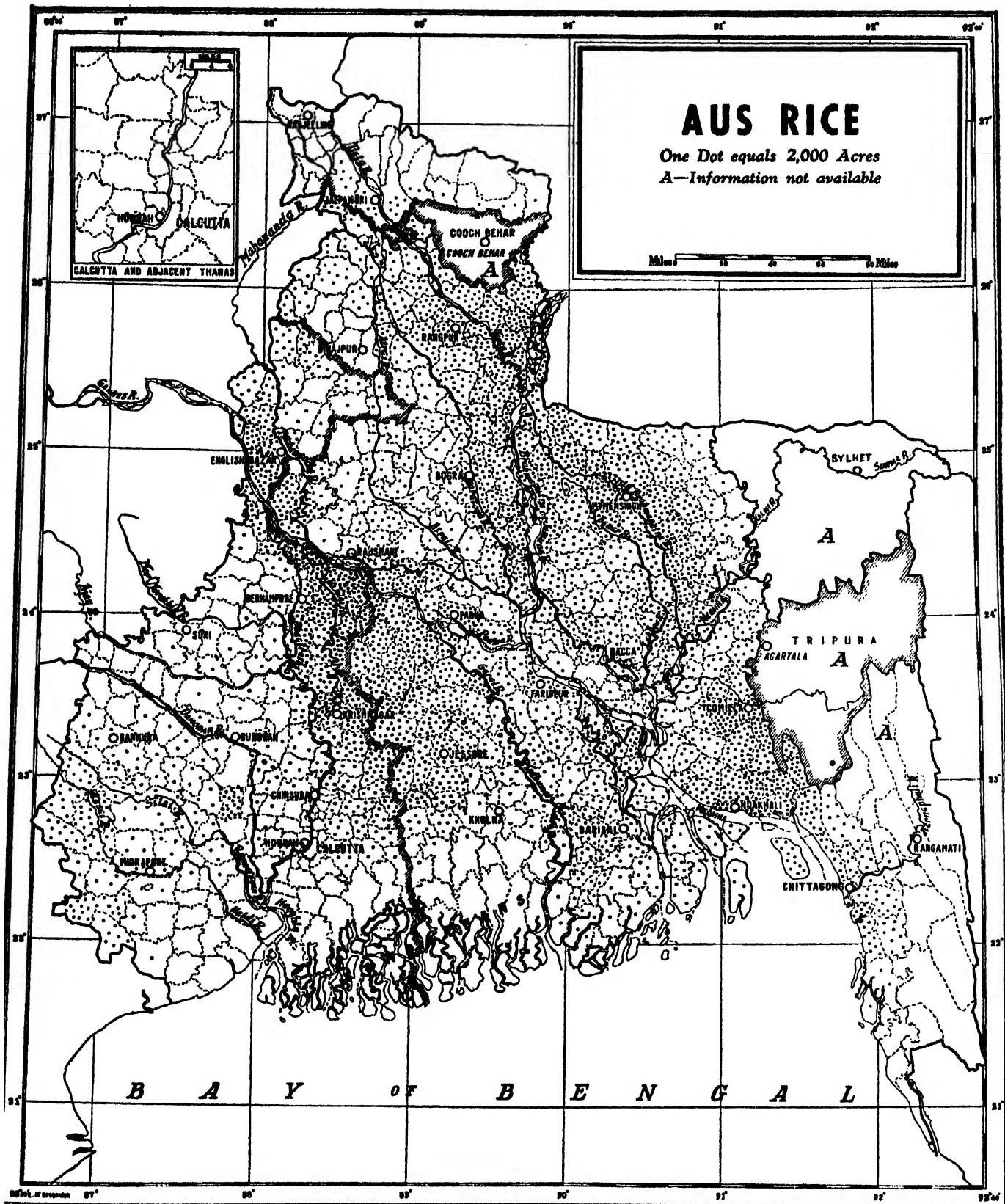
| | |
|-------------------|-----------------|
| West Bengal | 2,342,208 acres |
| East Bengal | 4,208,057 " |

In *West Bengal* aus grows mainly in the east in a belt extending from a little north of English Bazar to near Calcutta. The Bhagirathi forms the western boundary of the aus-growing region. In this tract is to be found about one-half of the total aus-land of West Bengal. The density of aus-land would have been still higher but for shifting cultivation. This type of cultivation is practised because the aus-land is seldom fertilized either by silts from flood water or by the addition of manures, and hence continuous cropping has to be interrupted by periods of fallow. In the Western higher part of the province some aus is grown. In the redearths region of West Dinajpur district aus rice is of the transplanted type and is not harvested till September.

In *East Bengal* aus rice is more widely cultivated. Parts of Rangpur, Bogra and Mymensingh districts form the northernmost block of the aus-growing regions of this province. There, aus grows best in loamy high

lands, but a special variety, *sali*, is also grown in low-lying marshy areas and in the flood plains of the Brahmaputra, Tista and the Karotoya, though at the risk of the entire crop being destroyed by early floods. The high lands of Dacca, Tippera, and Noakhali districts also grow aus. In Dacca this crop is usually grown in the more elevated parts of the Bhawal jungle area and also in high lands near the rivers. In Tippera district the level of the land determines the distribution of aus-growing land. The earliest kind of summer rice is known in this district, as *jali* which is sown as early as February and is followed by *sathia* and other kinds of quick growing aus. If more than $2\frac{1}{2}$ feet of water collects in the fields, aus and broadcast aman are sown together. In Noakhali district rajasal and four other varieties of aus rice are grown on char lands, and a number of varieties including *saltua* are sown broadcast on the eastern high lands. In Barisal district aus rice is usually sown with aman, and is occasionally followed by it. The latter type is transplanted in Nalchiti and Jhalakati areas, especially on the left bank of the Bishkhali river. The westernmost aus-growing region occurs between the Garai-Madhumati and the present western frontier. The districts of Kusthia, Jessore and northern part of Khulna belong to this region. In the eastern parts of Jessore district aus is grown alternately with jute. Its acreage is higher than that of aman because it is a surer crop and is grown on lands which are not liable to sudden inundation from floods. It is only in years of unusual drought that the aus-crop harvest is affected. In Khulna, aus is confined to the north-western part, where the delta-building process is no longer active. The present district of Kusthia (former Nadia) grows more aus than aman for the same reason.

Map 52



BORO RICE

MAP 53

Boro (Brihi in Sanskrit) means Spring. Boro is one of the hardiest crops, and is grown in low-lying tracts which remain wet till summer, and also along the borders of marshes. It is usually sown in January, and reaped in April or May. The much smaller acreage under boro rice in Bengal is due to the coarseness of the grain, and also to the fact that land suitable for its cultivation is extremely limited. This rice is entirely intolerant of salt water, and therefore cannot be cultivated in the saline or brackish water bils of South Bengal. The total acreage under boro rice amounted to 556,264, distributed as follows :

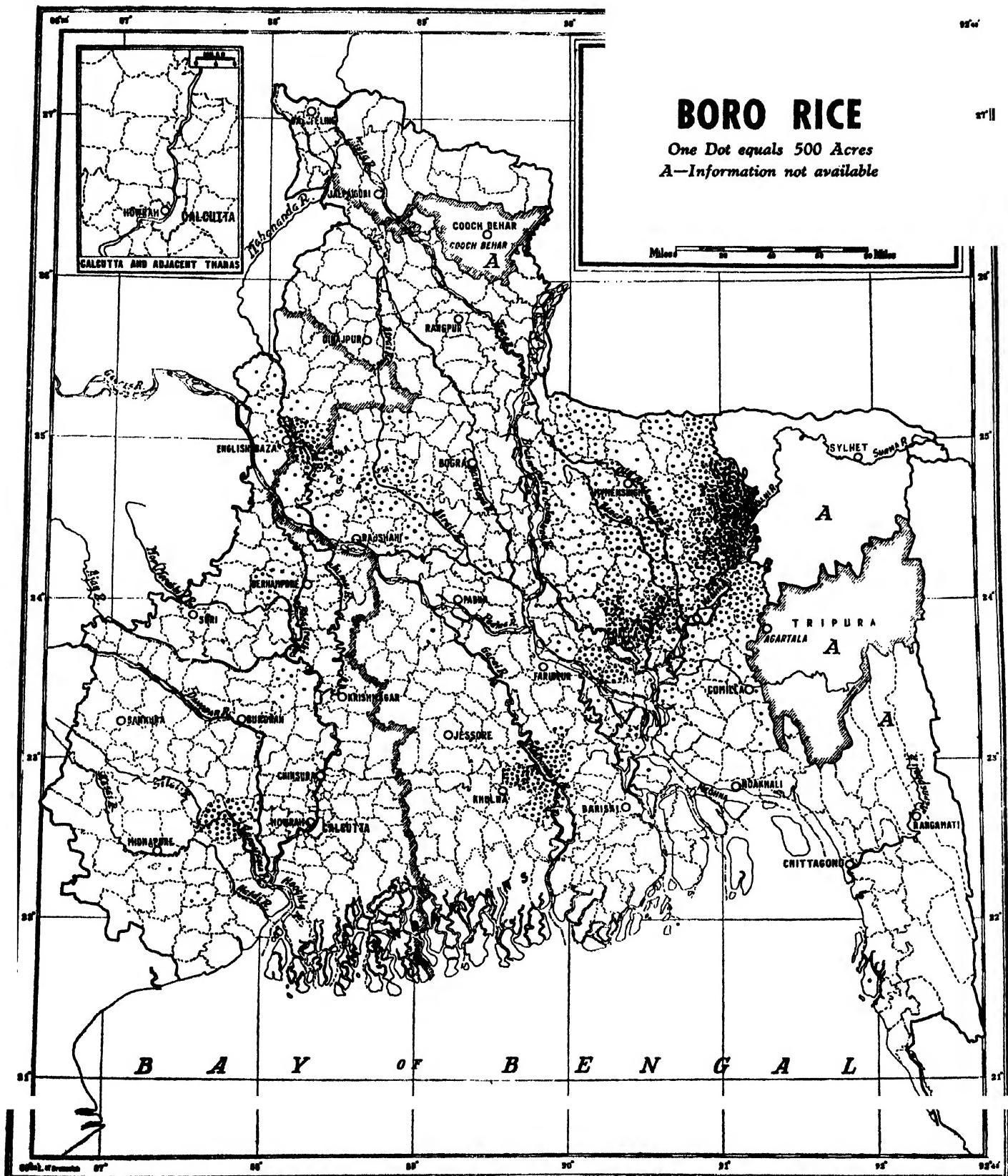
| | |
|------------------|--------------|
| West Bengal .. . | 54,780 acres |
| East Bengal .. . | 501,484 " |

West Bengal—This province grows very little boro rice. It is cultivated mainly in two areas—(1) the flood-plains of the Mahananda and adjacent marshy tracts near about English Bazar ; (2) the low-lying areas near Ghatal and Khanakul bordering on the Silai river. In these two areas are to be found over 62 per cent of the total acreage under this crop. In the Mahananda area a large number of bils retain flood waters of the Tangan and the Punarbhaba and as such provide excellent sites along their edges for the cultivation of boro rice.

East Bengal—In this province boro rice is cultivated intensively in the eastern marshy tracts of the Mymensingh district traversed by the Meghna river. This zone extends southward in the Brahmanbaria sub-

division of the Tippera district. This rice is grown not only along the edges of bils and khals but also on alluvial islands (chars) formed in the bed of the Meghna. Transplantation in this tract begins in December along the edge of a bil and goes on gradually as the bil dries up and the water level is lowered till the end of January. It may be mentioned that not all that is transplanted gets a chance to ripen. The plants grown earlier usually fail to ripen because of the dryness of the ground, and the plants transplanted last are usually cut before time, because of the danger of early April rains. Even if it is cut before it ripens, there may still be some use for it, especially as food for cattle. To the west of the Meghna region lies another concentration of boro-growing lands. There, much boro is grown on the banks of the Dhaleswari, and near the confluence of the Turag and the Buriganga. In Barisal district the acreage under boro is very small because the crop is liable to be destroyed completely by the floods, which come very suddenly. Madaripur marshes form the third boro-growing region in East Bengal, and this tract joins with the boro-growing region of the Khulna district across the river. In the latter district sweet water bils occurs only in the north-east and hence very little boro can be grown elsewhere. Two other varieties of bil rice, raida and kurmani, are included in the acreage figures shown under boro in Khulna. Raida is sown with boro but is not harvested till winter sets in. Kurmani is sown broadcast in April when the bils dry up, and is ready for harvesting by October.

Map 53



JUTE

MAP 54

Jute is the most important fibre crop of Bengal. Like rice, it is an accommodating crop. A glance at the map shows that it grows on high lands where it has to depend on local rains, in wet flood-plains, and in low-lying marshy tracts. But it grows best where the land is properly drained and receives abundant heat and moisture. It has taken the place of cotton in East Bengal, and is a rival of summer rice. It is an exhausting crop, and hence grows well in the flood-plains of the Brahmaputra, Padma and Meghna rivers, which get fresh deposits of river silts every year. Elsewhere, manuring of land, or fallowing, or rotation of crops is practised. The cultivation of jute requires greater care and more labour than that of rice. The harvesting time begins in June and extends to October, depending on the time of sowing the seeds. Late harvest increases the yield but lowers the quality of fibre. The percentage of land under jute would have been still higher but for the Government policy of restriction of jute-growing land. This war-time policy was adopted by the then Bengal Government with a view to securing an economic price for the cultivator and to encourage the cultivation of other kinds of crop, especially summer and winter rice. The recent policy of the Government of India is, however, to increase the acreage under jute in West Bengal as it is deficient in raw jute. The total acreage under jute was 2,034,235 in 1944-45 i.e. 5.3 per cent of arable land. Its distribution in the two parts of Bengal was as follows :

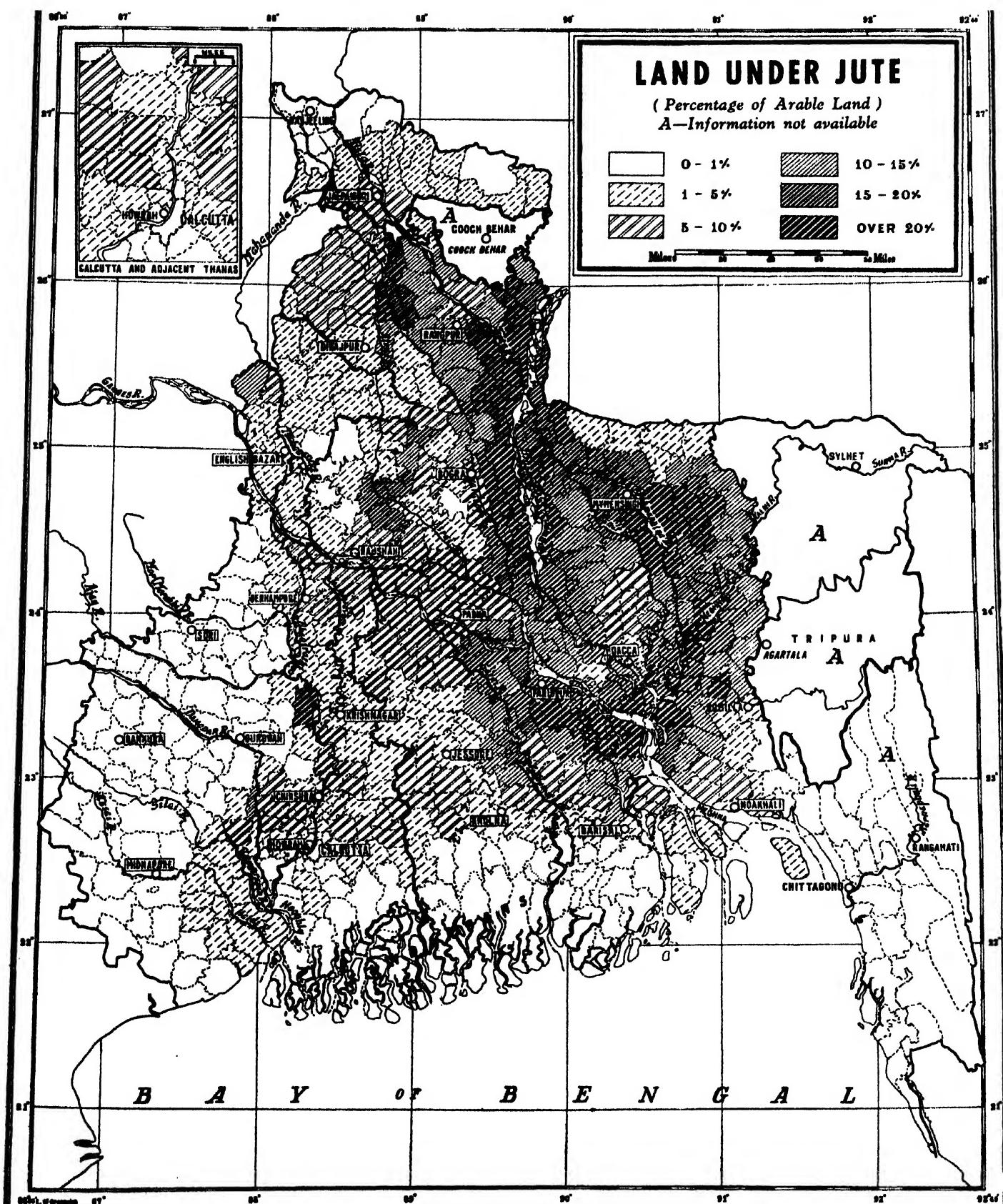
West Bengal ... 200,603 i.e. 1.5 per cent of arable land
East Bengal ... 1833,632 i.e. 7.1 per cent of arable land

West Bengal—In West Bengal jute-growing land occurs in the eastern part of the province. Even there the percentage is low, excepting in a small area (Purbasthali) bordering on the Bhagirathi. The reasons for the present low acreage under jute are the following :

(1) Scarcity of arable land for growing crops other than food crops. (2) Dearth of running water for the final washing of jute fibre. (3) Lateritic and gravelly soils in the western part. (4) Early floods necessitating the harvesting of the crop before it is ripe.

East Bengal—This province grows most of this crop. A glance at the map shows that even there it is not evenly distributed. The jute-growing belts follow the courses of the active rivers—the Padma and Meghna as far as the confluence of the two rivers. Further south the percentage drops appreciably. Rangpur, Mymensingh, Tippera, Dacca and Faridpur districts grow the best jute (*Capsularis*). Very little jute is grown in southern districts—Barisal, Noakhali and Chittagong because of saline soils, and preponderance of other cash crops—betelnut and coconut. Till recently jute was cultivated in low-lying tracts; gradually jute land extended to higher lands, away from rivers. The proximity to fresh flowing water for steeping is one advantage which the lowland jute has over the highland variety.

Map 54



RAW JUTE, JUTE PRESSES AND JUTE MILLS

MAP 55

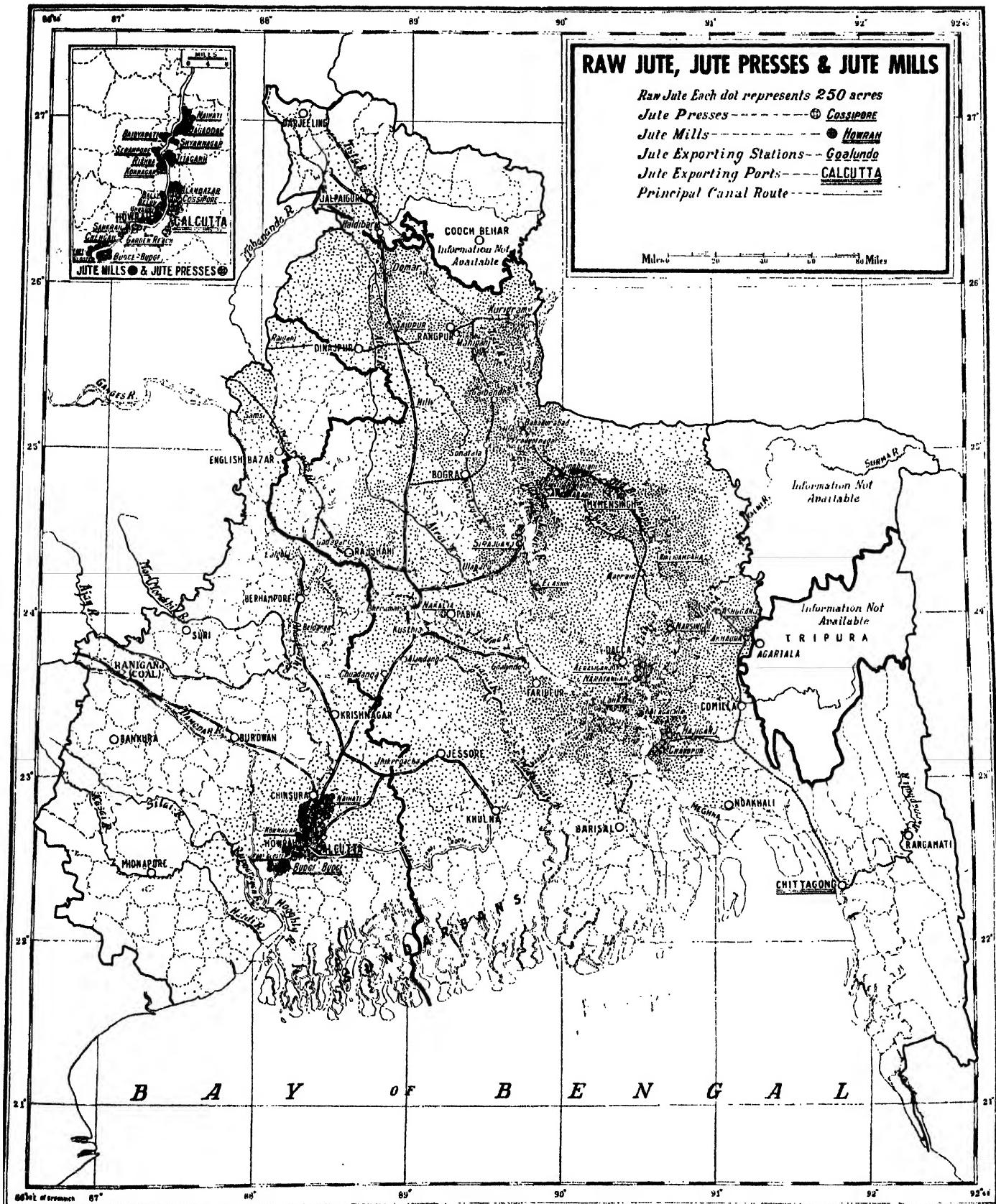
The map shows the distribution of jute-growing land and the jute pressing and jute manufacturing industries. It has already been pointed out that over 90 per cent of jute-growing land occurs in East Bengal. This has been clearly brought out by this map. It also shows extreme localisation of jute mills along and near the banks of the Hooghly river from a little north of Naihati to a little south of Budge Budge. In this fifty-mile stretch of the river there are as many as 100 jute mills, with 65,357 looms (1946), employing some 3 lakhs of workers daily. The first jute mill was established in 1869 at Rishra near Serampore (shown on the map) due to the availability of raw jute in Hooghly District and the existence of the jute-spinning and handloom weaving industry, and consequently skilled labour. Sea-going vessels could then sail up the Hooghly river to Serampore so that facilities for exporting jute manufactured goods were also there. Besides, coal could be obtained from the Raniganj coal-mining area, and the first railway line in Bengal was built from Calcutta to Raniganj to bring coal to feed the newly started jute mills.

With the development of the jute industry, more and more raw jute was needed and it was then found that optimum conditions for jute cultivation existed in East Bengal. Jute thus became the most important cash crop of East Bengal, replacing cotton and aus rice.

The map demonstrates that the Brahmaputra (both the old and present channels) Meghna, and Padma rivers flow through dense jute-growing lands. The great currents of the raw jute trade follow these rivers, including their tributaries, distributaries and canals. Sirajganj, Narayanganj and Chandpur are the principal river ports engaged in exporting raw and pressed jute by river steamers and country boats. Railroads also play an important part in moving this commodity from the producing to the consuming areas. The broad-

gauge main line running north-south between Jalpaiguri and Calcutta along with its two principal feeder lines coming from Sirajganj and Goalundo, carry the bulk of the raw jute during the harvesting season. In 1939-40 the railways alone carried 22,849,266 maunds of raw jute. Most of the railway stations, which normally forward more than 1 lakh maunds of jute, have been located on the map. Goalundo leads in this respect, forwarding about 15 lakhs of maunds to the Calcutta jute mills area. Sarishabari in Mymensingh district, and Sirajganj in Pabna district occupy second and third position respectively. The five stations on the Mymensingh railway line, Mymensingh, Nandina, Singhajani, Bausi and Sarishabari export between them in a normal year about 25 lakhs of maunds of jute. In 1946-47 the Calcutta mills area received 28,721,581 maunds of raw jute by rail and river. Raw jute is compressed (by the steam hydraulic press), to reduce the bulk of the fibre and is then exported. The pressing industry was first located around Calcutta. Cossipore still has the largest number of jute presses. But the majority of the jute presses of all types are now located in East Bengal: Chandpur, Narayanganj, Sirajganj, Sarishabari, Elashin and Akhaura. Since the establishment of world trade in jute Calcutta has been the principal port, handling raw jute and jute manufactured goods for overseas markets. The port of Chittagong ranked distant second, and exported normally a few thousand bales. But now with the imposition of heavy duty on raw jute moving towards Calcutta, traffic in raw jute may be diverted more and more towards Chittagong. In fact, the arrival of raw jute at Calcutta has been slow this year (1948) due to a number of factors including dislocation of railways in East Bengal and political uncertainties, and it is expected that the shipment of raw jute from the Chittagong port will exceed 6 lakhs of bales before the 30th June, 1948.

Map 55



RABI CROPS

WHEAT

MAP 56

Wheat is gaining popularity in Bengal, and hence the acreage under this crop has been steadily increasing in recent years. It requires a clayey soil or better still a sandy loam, and grows best where the winter months are dry and cool. The area under this crop was 199,581 acres in 1944-45, distributed as follows in the two parts :

| | |
|-------------------|---------------|
| West Bengal | 99,439 acres. |
| East Bengal | 100,142 " |

In West Bengal, Murshidabad district leads in wheat production, having about one-half of the total wheat-growing land. Most of the remaining wheat-growing land is found in Malda, Birbhum and Bankura districts. In Malda it is confined to the west of the Mahananda, and in the other two districts it is more evenly distributed. Wheat is also grown in Burdwan and Nadia districts.

In East Bengal, Rangpur and Rajshahi districts lead in wheat production, having between them more than one-half of the acreage under this crop. In both these districts wheat is mainly cultivated in riparian tracts. It is only in Kushtia that this crop is cultivated away from rivers banks.

BARLEY

MAP 57

Barely grows under the same climatic and soil conditions as wheat. The acreage under this crop was slightly higher than that of wheat, 212,817 acres in 1944-45, distributed as follows:

| | |
|-------------------|---------------|
| West Bengal | 72,606 acres. |
| East Bengal | 140,211 " |

In West Bengal that part of Malda district which lies to the west of the Mahananda, leads in barley production, having more than one-half of the acreage under this crop. It continues on the high banks of the Ganges and Bhagirathi in Murshidabad. The cultivation of barley is more localised than that of wheat in West Bengal.

In East Bengal barley is grown in two types of land: (1) the high lands fringing the Padma, Jamuna (Brahmaputra) and Dhaleswari rivers and (2) the undulating uplands of Dinajpur district.

MAIZE

MAP 58

Maize grows best in well-drained gravelly loam soil. The acreage under this crop was 146,073 in 1944-45, distributed as follows :

| | |
|-------------------|---------------|
| West Bengal | 133,675 acres |
| East Bengal | 12,398 " |

In West Bengal the mountainous district of Darjeeling leads in maize production, having about one-half of the total acreage under this crop. In the plains the western part of Malda has the highest acreage. Some maize is also grown along the western upland border of the province.

In East Bengal there is only one area near the confluence of the Atrai and Baral rivers with some concentration of maize fields. Elsewhere, especially in Dinajpur, small plots are so scattered that they cannot be shown on the map.

GRAM AND MILLETS

MAP 59

The cultivation of both gram and millets is extremely localised in Bengal. Millets such as marua (*Eleusine coracana*) are grown only in the Darjeeling Himalayan region. West Bengal has, therefore, all the acreage under millets, 26,545.

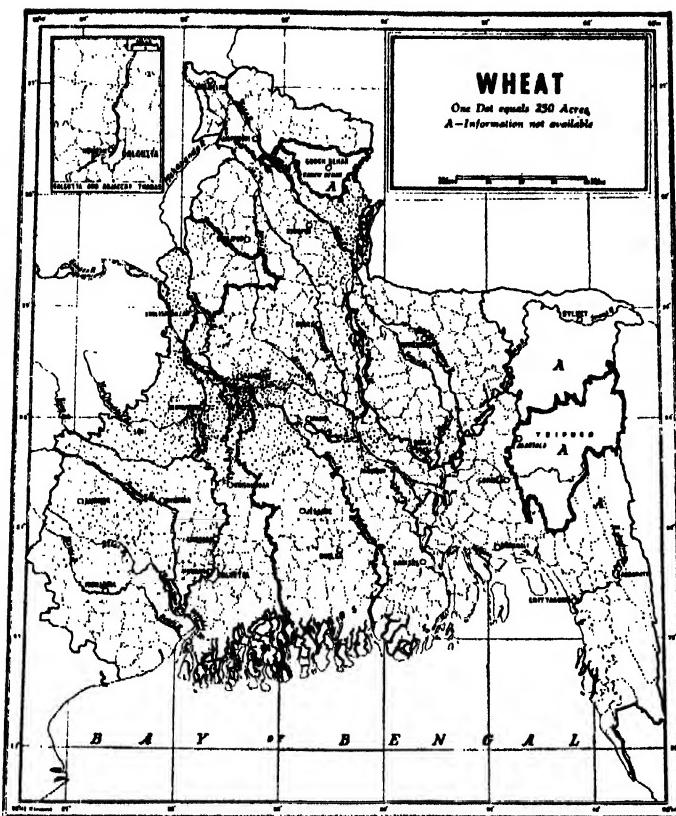
Gram is a pulse, used both for human consumption and fodder. It gives a slightly larger yield than most of the other pulses, and is grown as a cash crop in Central Bengal, bounded on the north by the Padma, on the west by the Bhagirathi and on the east by the Garai. The partition of Bengal has resulted in dividing this gram-producing region. The total acreage under the crop was 596,631 distributed as follows in the two parts of Bengal :

| | |
|-------------------|---------------|
| West Bengal | 312,774 acres |
| East Bengal | 283,857 " |

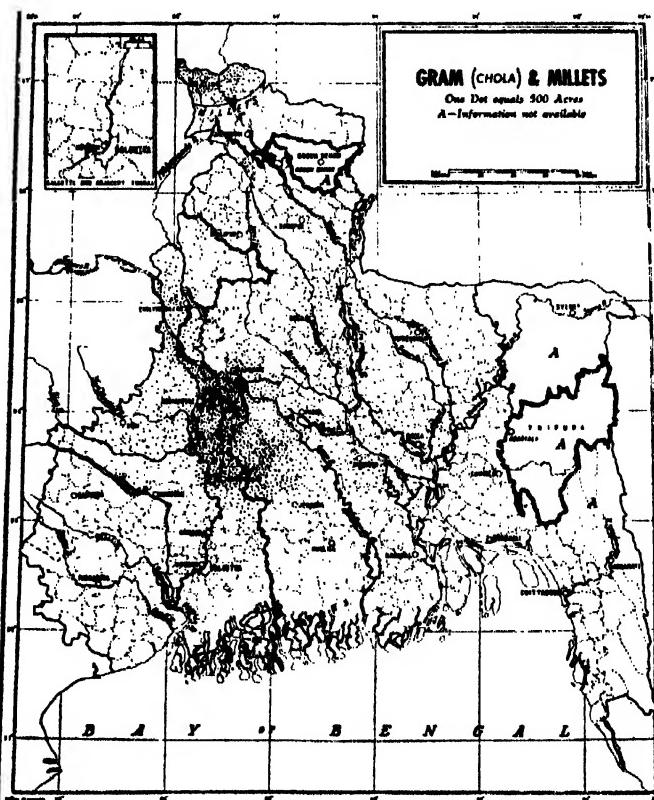
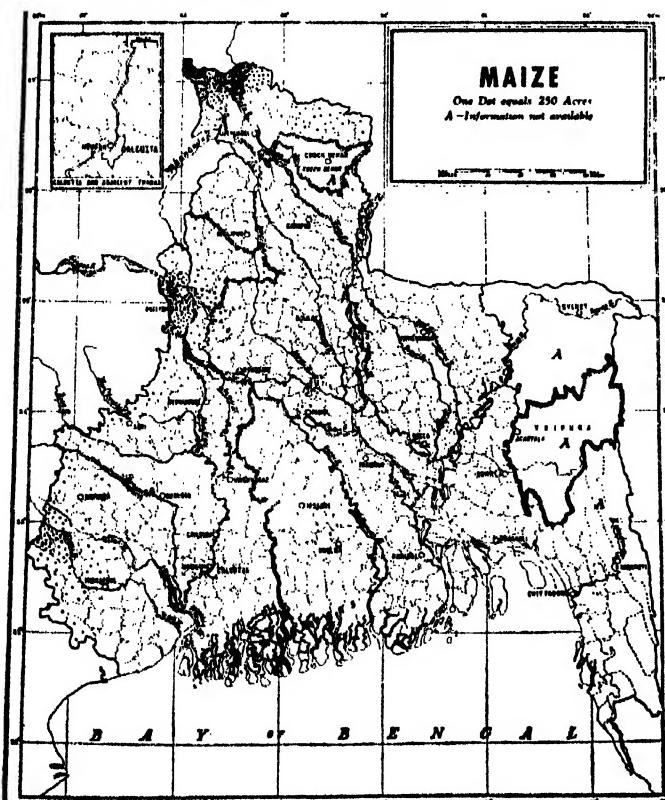
In West Bengal more than two-thirds of the gram-producing area is found in Murshidabad and Nadia districts, forming one block.

In East Bengal, Kushtia and Jessore lead in the production of this crop, having one-half of the acreage under gram.

Map 56



Map 57



Map 58

Map 59

PULSES

Pulses are grown on inferior lands, generally as a supplementary crop to aus rice. The chief varieties, grown in Bengal, have been plotted on the four maps—Khesari, Masur, Maskalai and Mung. They are all harvested from February to April, and require comparatively little attention.

MAP 60

KHESARI

The distribution of the khesari-growing land on the map indicates that the crop favours inundated areas. The total acreage under this crop in 1944-45 was 1,167,547, distributed in the two parts of Bengal as follows :—

| | |
|-------------------|---------------|
| West Bengal | 231,201 acres |
| East Bengal | 936,346 ,, |

In West Bengal the Tamluk subdivision of Midnapore and the Diamond Harbour subdivision of 24-Parganas lead in khesari production, about one-third of khesari-growing land being concentrated in this tract. Other concentrations are found in Murshidabad district along the banks of the Jalangi and Bhagirathi, and in the north of Birbhum district. In view of the fact that this crop grows along with aman rice, and requires no extra ploughing, attempts should be made to increase its acreage.

In East Bengal it is more widely cultivated, mainly in the flood plains of all the active rivers. The greatest concentration is found near the confluence of the Atrai and Barai, and along the banks of the Dhaleswari.

MAP 61

MASUR

Unlike khesari, masur can be grown both in highlands and lowlands. The map has brought out this point clearly. The acreage under this crop was 535,983 distributed as follows :

| | |
|-------------------|---------------|
| West Bengal | 195,557 acres |
| East Bengal | 340,426 ,, |

In West Bengal, Murshidabad leads in masur produc-

tion. There, it is grown mainly along the Ganges. In the northern part of 24-Parganas on the other hand, masur is cultivated away from large rivers.

In East Bengal, Jessore and Rajshahi districts lead in this crop. The former district grows it in highlands and the latter, in low-lying lands.

MAP 62

MASKALAI

This variety of legume grows very quickly, and is widely used for laying claim to newly formed charland. The acreage under this crop was 1,99,511, distributed between two parts of Bengal as follows :

| | |
|-------------------|--------------|
| West Bengal | 48,606 acres |
| East Bengal | 150,905 ,,, |

In West Bengal this crop is also cultivated in highlands, hence Midnapore (Gopiballavpur area) leads in this crop. The charlands of Murshidabad also grow considerable quantities of maskalai.

In East Bengal it is mainly in the flood plains of the Brahmaputra (both old and new), Padma, Dhaleswari and Meglina that this crop is cultivated.

MAP 63

MUNG

This is a better type of pulse and hence fetches a good price. The yield is also lower than that of other varieties. It grows best in sandy loam soils. The acreage under this crop was 183,564 in 1944-45, distributed as follows :

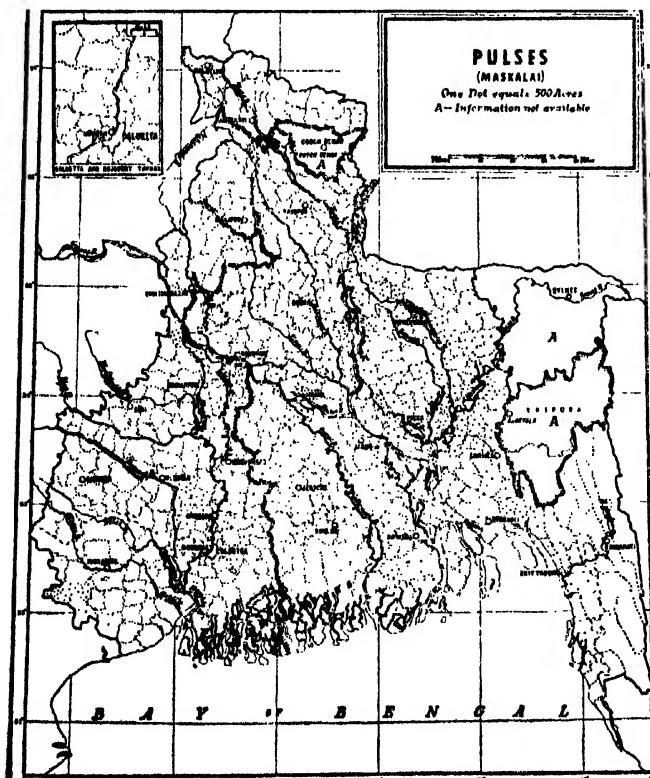
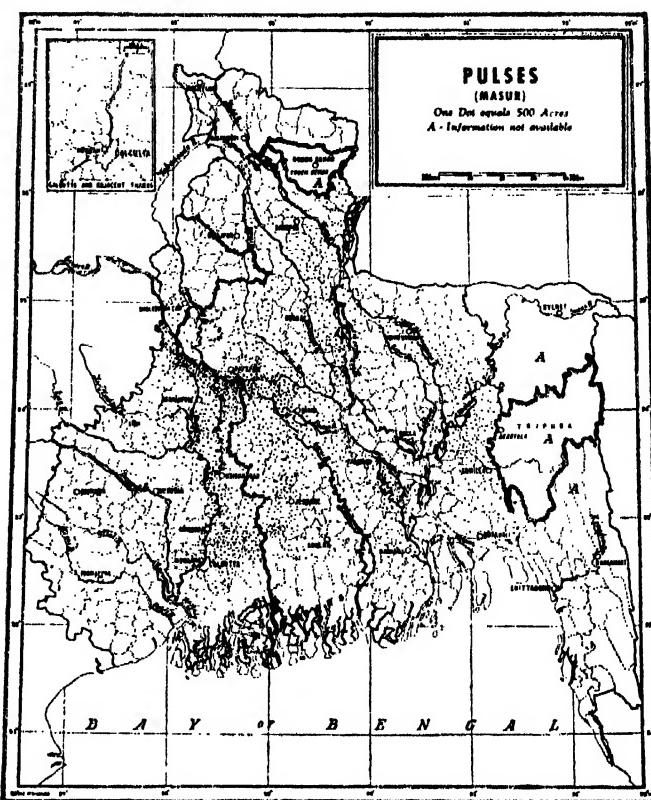
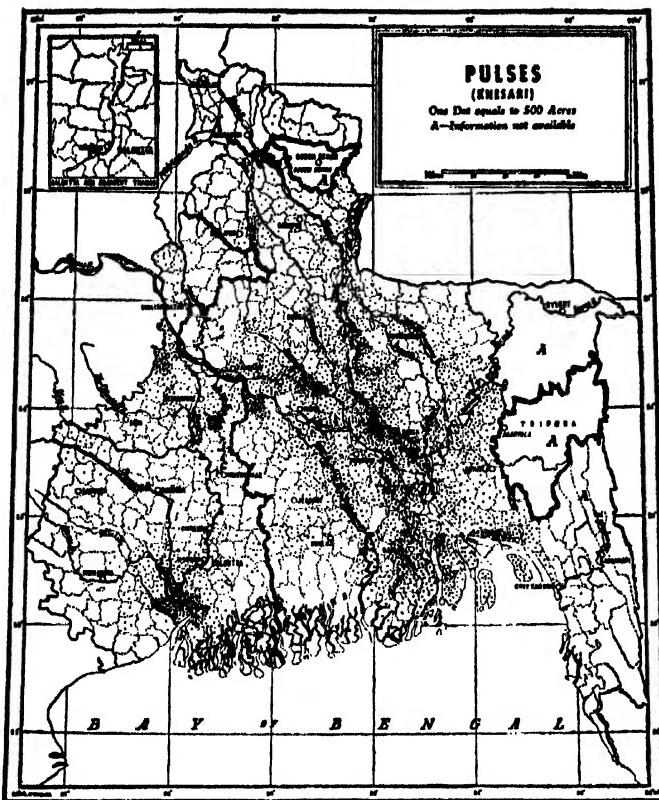
| | |
|-------------------|--------------|
| West Bengal | 57,880 acres |
| East Bengal | 125,684 ,,, |

In West Bengal, Midnapore district leads in the production of mung, more than two-third of mung-growing land being found there. Some mung is also grown in the northern part of 24-Parganas district.

In East Bengal there is some concentration of mung-growing land south of Jessore district (Monirampur-Keshabpur area) and also in the charlands of Bakarganj and Noakhali districts.

Map 60

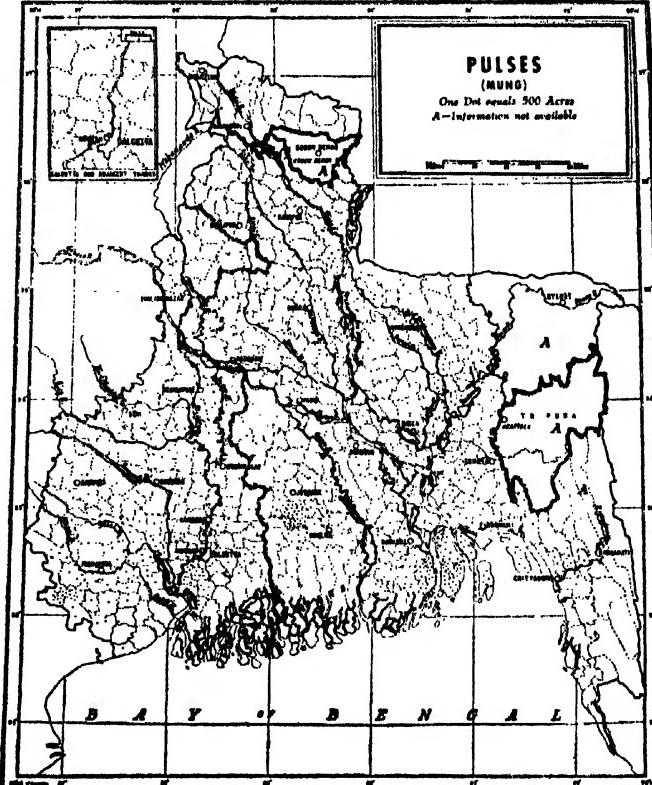
Map 61



Map 62

81

11



Map 63

CASH CROPS

MAP 64 POTATOES

The introduction of this crop to Bengal is comparatively recent, though in the plains of Bengal it can grow well on jute or aus rice land. The acreage under this crop was 2,04,255, distributed in the two parts of Bengal as follows :

| | |
|-----------------------|--------------|
| West Bengal | 92,089 acres |
| East Bengal | 112,166 , , |

In West Bengal the tract between the Damodar and Hooghly rivers leads in the production of this vegetable, more than one-half of potato land occurring in Hooghly and Howrah districts. The proximity of this tract to urban centres might have given impetus to the cultivation of this crop.

In East Bengal potatoes are grown in small plots throughout the districts of Dinajpur, Rangpur and Bogra, some concentration being found only along the banks of the Karatoya near Bogra. Potatoes are also grown east of the old Brahmaputra in Mymensingh district, and along the Meghna in Tippera district.

MAP 65

TEA AND COCONUT

Tea is grown only in three widely separated tracts : the Himalayan and Terai regions in the north ; the undulating upland in the south of Sylhet ; and the eastern undulating Chittagong plains and uplands. The acreage under tea was 197,971 : West Bengal, 189,559 acres ; East Bengal, 8,412 acres. The figures for East Bengal do not include that of Sylhet district.

In West Bengal the acreage under tea is greater in the Jalpaiguri piedmont plain (129,957 acres) than in the Darjeeling Himalaya (59,602 acres), though the first tea plantation on a commercial scale was started in the hills. In Darjeeling, tea plantations are confined to the west of the Tista river, and in Jalpaiguri district, mainly in the Western Duars region.

In East Bengal, tea is grown in the northern parts of Chittagong district, and on the high banks of the Karnaphuli river in the neighbourhood of Chittagong town.

Coconut cultivation is confined to the southern part of both West and East Bengal, as coconut grows best in saline soils. The acreage under the crop was 58,867 : West Bengal, 16,441 acres ; East Bengal, 42,426 acres. In West Bengal a tract covering the district of Howrah and extending northward in Hooghly and eastward

across the river in 24-Parganas, grows most of the coconuts. In East Bengal a tract extending from Jessore to Barisal leads in coconut production.

MAP 66

CHILLIES AND CARDAMOM

Chillies are grown with considerable care and attention. The acreage under this crop was 186,399. East Bengal has a much greater acreage (173,664 acres) than West Bengal (12,735 acres). In East Bengal the southern districts—Barisal, Noakhali and Chittagong lead in the production of this crop. Tippera also grows considerable quantities of chillies, mainly along the banks of the Meghna. In West Bengal, chillies are grown mainly in West Dinajpur.

Cardamom trees grow in the cooler parts of Bengal, the Darjeeling Himalaya. The acreage under the tree was 5482, most of the trees growing in Kalimpong and Pool Bazar.

MAP 67

CINCHONA, MULBERRY, INDIAN HEMP AND WILD DATE PALM

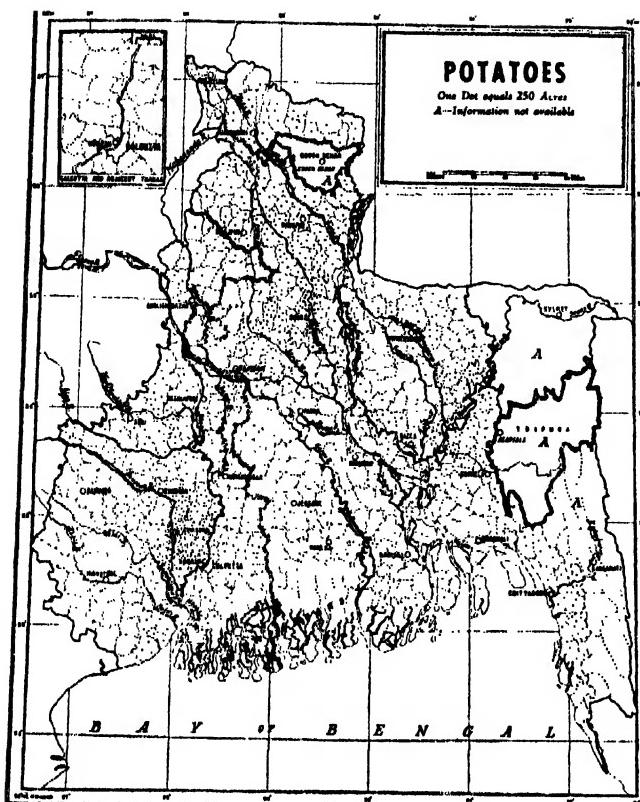
Quinine is manufactured from the bark of cinchona trees. Cinchona plantations are owned and managed by the Government of Bengal. They occur in two tracts in the Himalayas : the Mangpu area west of the Tista and the Mansang area near the confluence of the Tista and the Rangpo. The acreage was 7,759 in 1944-45.

Mulberry trees and bushes are grown for the leaf which is fed to silk worms. The acreage under mulberry was 18,465 in 1944-45. Practically all the mulberry trees and bushes occur in West Bengal (16,514 acres). This crop is highly localised. English Bazar is the centre of mulberry cultivation, and has near the town 10,690 acres of mulberry land. West of Berhampore there is another concentration in Murshidabad district.

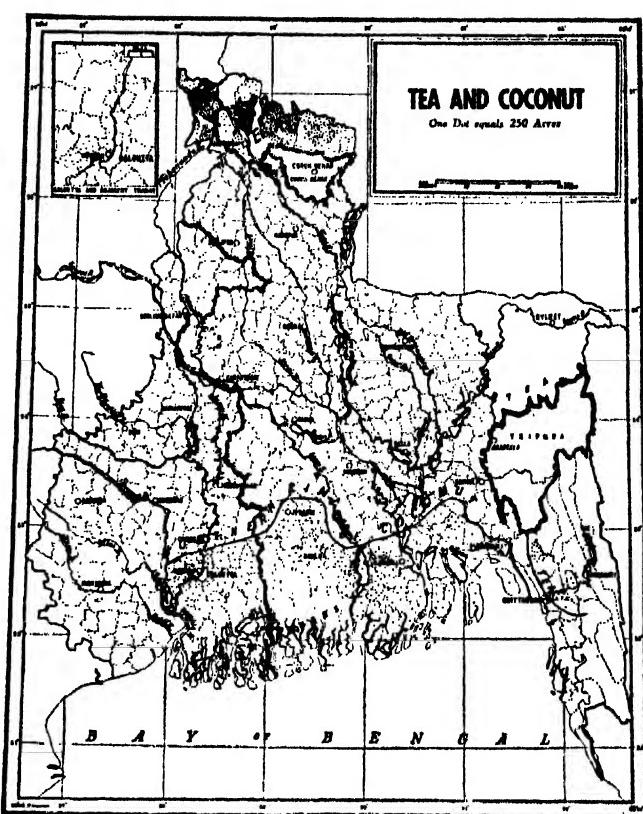
Indian Hemp (*Ganja*) is also a Government monopoly. It is grown only in a small tract lying in the north-eastern corner of Rajshahi district—the Naogaon area. The present province of East Bengal has, therefore, the entire acreage under this crop (593 acres).

Wild Date Palm grows more frequently in small numbers round homesteads or in uncultivated lands. Compact groves are rare. It is the most important fruit tree growing in Khulna and Jessore districts. The total acreage under this tree was 57,958 : West Bengal (10,254 acres), East Bengal (47,704 acres).

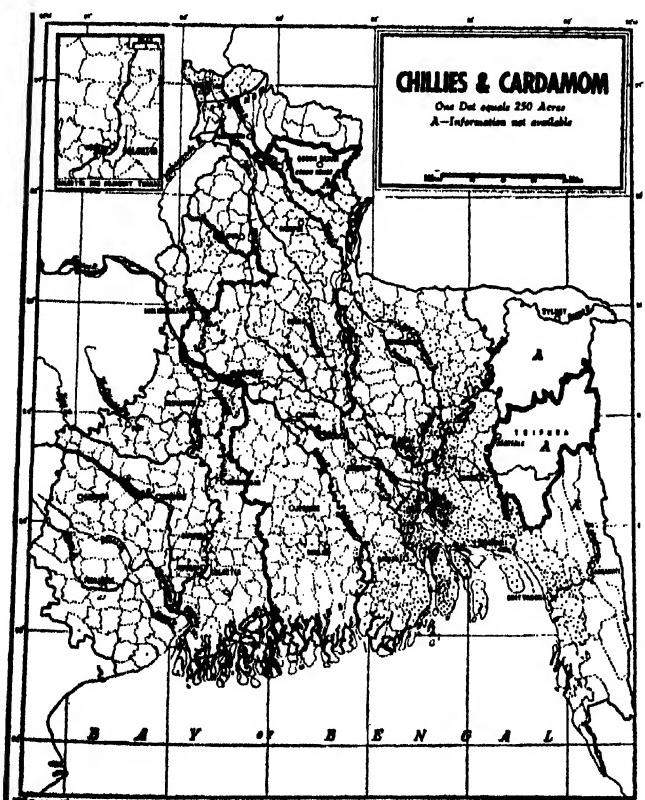
Map 64



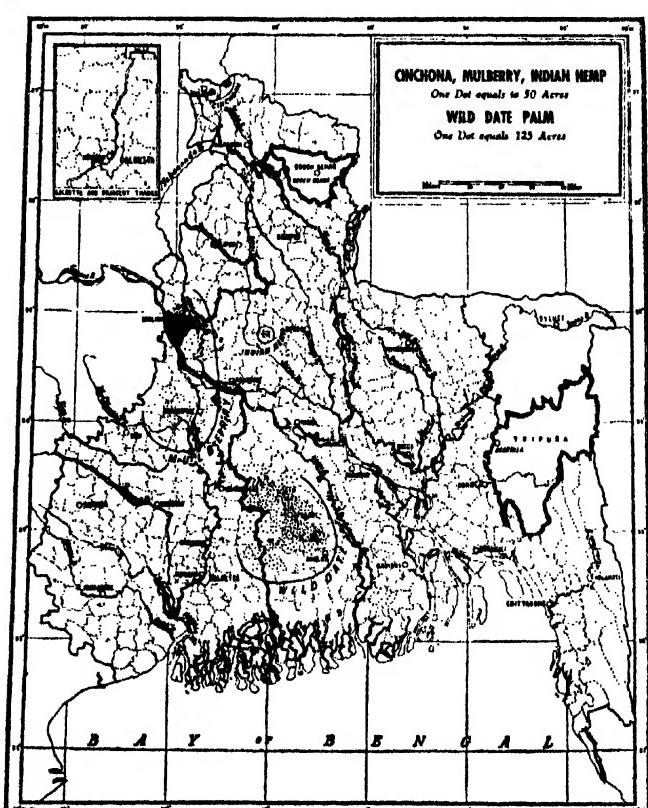
Map 65



Map 66



Map 67



CASH CROPS

(Continued)

MAP 68

SUGAR-CANE AND ORANGES

Sugar-cane is gaining in importance in recent years. The area under this crop was 173,916 acres, distributed as follows :

| | |
|-------------|--------------|
| West Bengal | 53,743 acres |
| East Bengal | 120,173 " |

Because of prohibitive cost of cultivation the poor cane growers of Bengal cannot increase the acreage under this crop. In West Bengal most of the sugar-cane at present grows in an area bounded on the south by the Damodar, on the east by the Jalangi and on the north by the Ganges-Padma. In East Bengal it grows mostly in charlands and along the river banks. The only exception is the northern part of Dinajpur district.

Oranges are grown only in the lower slopes of the Darjeeling Himalaya. There is a very great demand for Darjeeling oranges in Calcutta which can be at least partially met if the problems of picking, packing and transportation are successfully tackled. The area under this fruit was 1,742 acres, all in West Bengal. The estimated annual production is some 410,160 maunds.

MAP 69

TOBACCO

This is grown on a commercial scale in the northern piedmont plains of Jalpaiguri and Cooch Behar and also along the banks of the Tista river, mainly in Rangpur District. The northern limit of tobacco cultivation is determined by the frost-line. The southern edge of the piedmont plain between the Tista and Torsa is considered to be the best tobacco land. Elsewhere in Bengal, tobacco is grown mainly for home consumption. The area under this crop was 161,554 acres : West Bengal, 20,695 acres; East Bengal, 140,859 acres.

In West Bengal tobacco is grown as a commercial crop mainly in Jalpaiguri district, where more than one-half of the tobacco land is to be found. East Bengal likewise grows tobacco for commerce only in Rangpur district (68,462 acres) as shown on the map.

MAP 70

MUSTARD SEEDS

Of the oil seeds grown in Bengal (mustard, linseed and sesamum) mustard seeds are the most important. Mustard-oil pressing is an important cottage industry and there is a very great demand for mustard oil as it is used by the people of Bengal for culinary purposes. The area under this crop was 536,801 acres ; West Bengal—138,038 acres ; East Bengal—398,763 acres.

In West Bengal oil-seeds are grown mainly in the forest clearings of Jalpaiguri district, and the pasture lands of Dinajpur and Malda districts. In view of the fact that mustard seeds can grow in any type of soil, and need very little attention from the farmer, it is surprising why the acreage under this crop is so low in the tract lying west of the Bhagirathi river. In East Bengal mustard seeds are grown mainly in the northern part of the province.

MAP 71

BETEL VINE AND BETEL NUT PALM

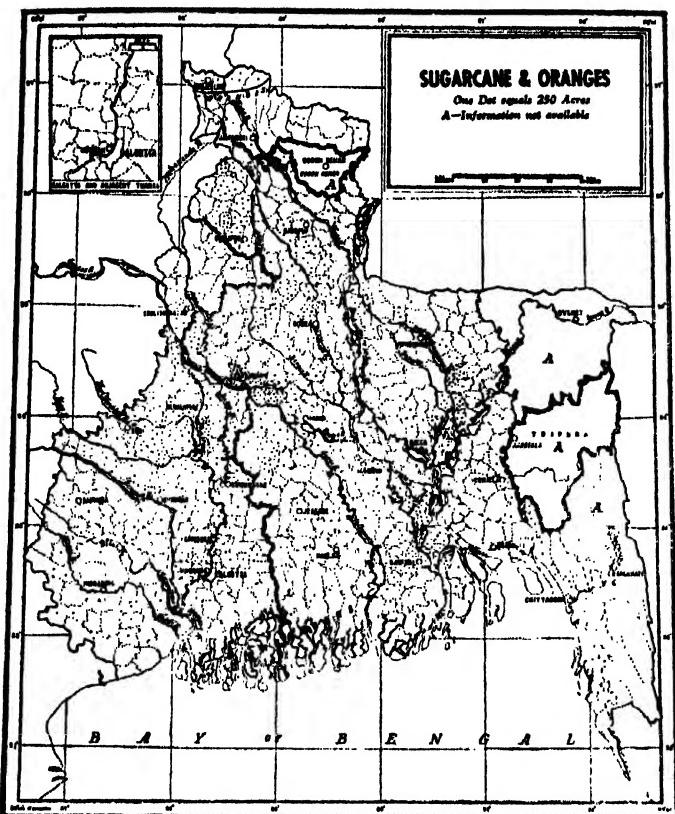
Leaves of betel vine or *pan* are chewed by men with or without mixing it with dried tobacco leaves. *Pan* requires heavy manuring, constant attention and skilled labour. Hence, wherever these conditions are satisfied and ready markets are available, *pan* is cultivated on a large scale. The map shows that the distribution of *pan baroj* (betel vine groves) is extremely localised. The area under this garden crop was 25,130 acres: West Bengal, 6,994 acres. East Bengal, 18,136 acres.

In West Bengal, Howrah leads in the cultivation of *pan*. Next comes Midnapore. In East Bengal, Rajshahi, Jessore, Khulna, Dacca and Barisal districts contain most of the *pan baroj*.

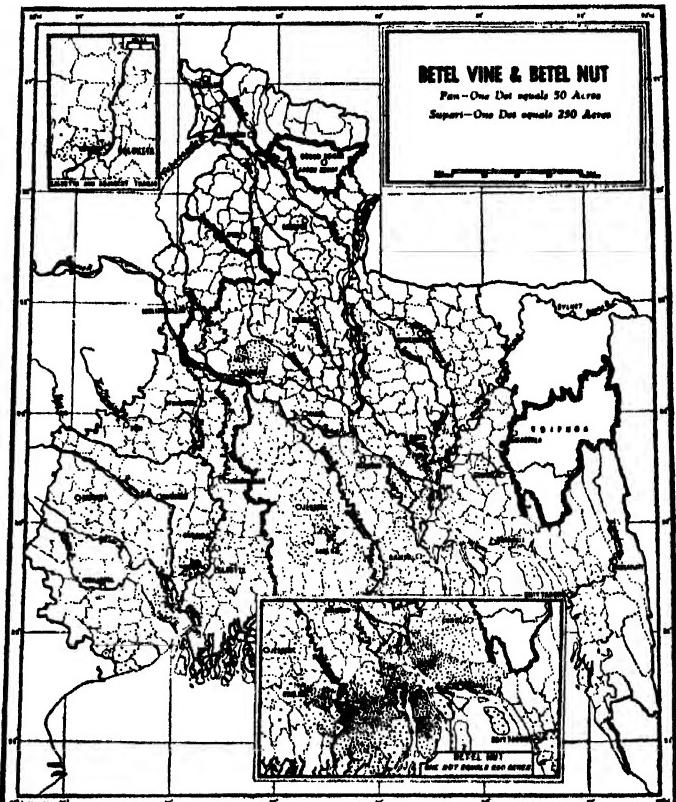
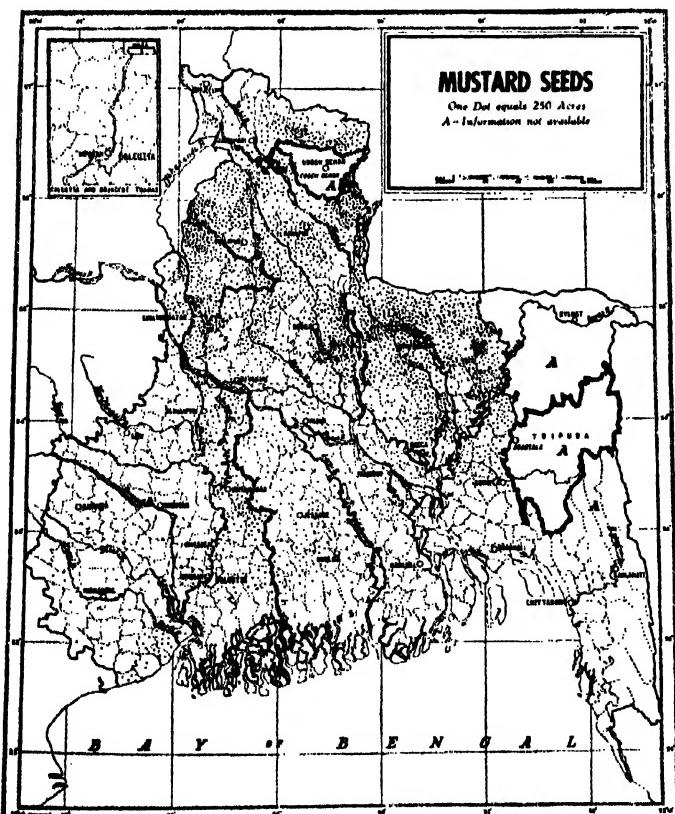
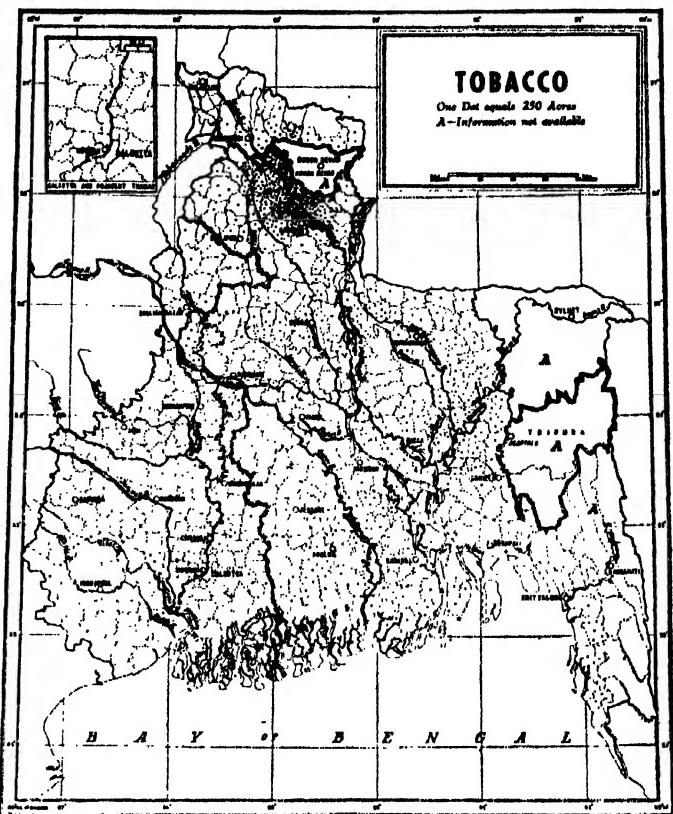
The inset map shows the distribution of supari or betel nut palm (*Areca catechu*) which is grown on the homestead land, mainly in the typical deltaic tracts. The area under this crop was 2,66,172 acres: West Bengal, 3,502 acres ; East Bengal, 2,62,670 acres.

West Bengal is at present hopelessly deficient in this crop. Cyclones in recent years are mainly responsible for this, as they did great damage to the slender trees. In East Bengal, Barisal and Noakhali districts lead in the production of *supari*.

Map 68



Map 69



Map 70

Map 71

COTTAGE INDUSTRIES

MAP 72

In Bengal, cottage industries occupy an important position in the economic structure of the province. It is estimated by the Bengal Industrial Survey Committee (1948) that no less than 8 lakhs of workers are engaged in industries by hand, as against 6 lakhs employed in factory industries. *Handloom cotton-weaving* is by far the most important. The map shows not only important cotton-weaving centres like Santipur, but also the extent of areas where practically every village round about a town of some importance, say Tangail, is a cotton-weaving centre. The important distributing centres both in West and East Bengal have also been indicated on the map. The relative production and value of cotton goods in each district in undivided Bengal has been indicated by the proportional sizes of the letters C and R, the former representing the quantity in yards, and the latter, value in rupees, based on figures published in the report on the handloom cotton-weaving industry in Bengal (1940). In some districts only one letter could be drawn on the scale adopted. For example, R without C in Dinajpur district means that cotton cloth produced in that district is of a finer quality fetching a higher price than in Bakarganj district, where the value in terms of rupees could not be indicated on the scale. In 1939-40 production of handloom cotton fabrics from mill-made yarn amounted to 144,699 yds. and was valued at Rs. 5,11,21,872.

The following is an extract from the Report of the Bengal Industrial Survey Committee published in 1948. "The most important of the present handloom weaving centres of the province are distributed over five districts, viz., Hooghly, Nadia, Dacca, Mymensingh and Noakhali. Rajbalhat and Farasdanga are the two principal centres in Hooghly. In the former there are 2,400 working members who together annually consume about 60,000 lbs. of yarn of counts varying from 60 to 120. The products of these centres consist of high-class dhuties and sarees principally. Annual production here is estimated to be worth about Rs. 2 lakhs. At Farasdanga, the other important centre, there are at present 150 workers and they together consume annually yarn of counts between 70 and 100 worth about Rs. 18,000. The principal productions are dhuties and sarees. In Nadia the principal centre is Santipur. Here altogether 4,000 weaving workers and 3,450 looms

annually consume about 34,500 lbs. Generally yarns of 80 counts and onwards are used by the weavers. Fine sarees with beautiful borders of jari, silver or gold are the specialities of this centre. Leading amongst the important centres in Dacca are Madhabdi, Abdullapur, Demra, Algi, etc. There are 25,000 weaving workers round about Sekhercharhat and Madhabdi or Baburhat, a large portion of whom work mainly on wage system. There are nearly 8,000 looms, and they are employed to produce fabrics mainly for the cheapest market. Products include saree, lungi, net sheet, wrapper, dhuties, towel, gamchas, bed sheets, etc., value of monthly production of all of which together has earned a wide reputation. Sarees are woven at Abdullapur, another important centre of the same district. The industry here is run by 125 workers with 100 looms. Total production of this centre is for sarees, valued at about Rs. 3,500 per month. Jamdani sarees of Dacca are woven in centres like Nowabpur, Tarboo, Rupsi and a few others. The total number of workers who weave such sarees in these is about 850. The principal centres in the district of Mymensingh are within a radius of 9 miles around the subdivisional town Tangail. The number of weavers in these centres is about 5,000 and that of looms in use exceed 4,000. The products are mainly sarees and dhuties with muga and jari borders. The most important centre in the district of Noakhali is Chaumuhani with about 6,000 workers and 4,500 looms. Products of this centre are of cheaper varieties. It is estimated that about 600 maunds of finished products are annually turned out and 750 maunds of yarn are consumed. About 90 per cent of the workers here weave khadi out of the yarn spun by local workers."

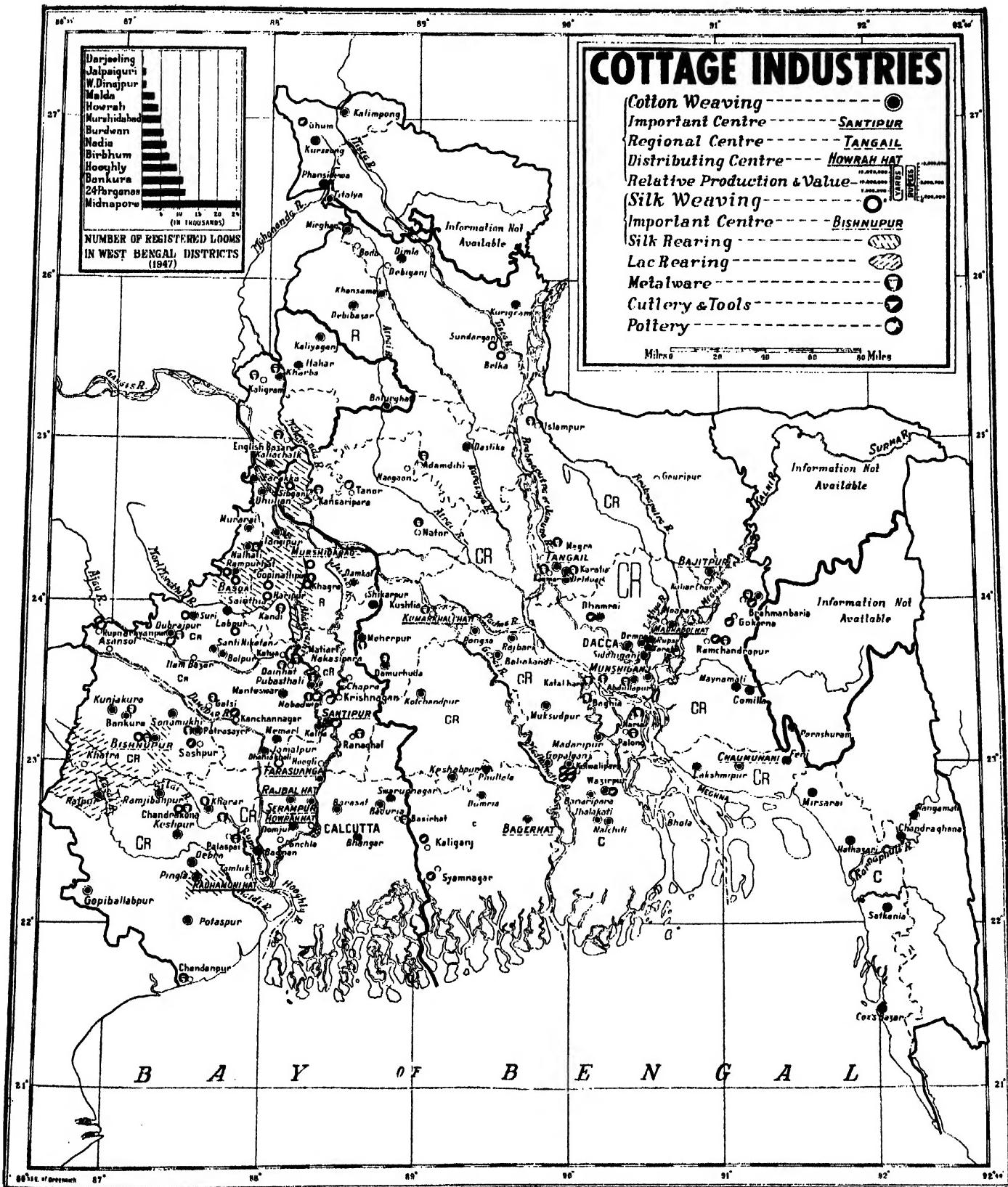
Silk weaving is another important cottage industry. This is confined to West Bengal, Bishnupur and Murshidabad being the principal centres. The extent of the silk rearing industry has also been indicated on the map. The area lying west of the Mahananda and Bhagirathi, and north of the Mor forms the main silk-rearing bloc.

Lac for shellac is reared in the south-western part of Bankura district with Khatra as centre

According to the report of the Bengal Industrial Survey Committee the annual production of metal ware (brass and bellmetal) is 126,609 maunds and the number

(Continued on page 90)

Map 72



MANUFACTURING INDUSTRIES

MAP 73.

The location of manufacturing industry, as shown on the map is based on data for the year 1942 supplied by the Chief Inspector of Factories, Bengal. The map also shows the distribution of rural trade centres (represented by dots), principal railroads, and waterways (thick continuous lines) linking the Hooghly industrial region with the navigable rivers of East Bengal through Khulna and Barisal towns.

The index for the map looks formidable, but the real story is told by only a few symbols on the map itself. The industries of Bengal hardly employ 10 per cent of the gainfully-occupied population, and do not produce enough even to meet local demands. The jute industry is the only exception. It is by far the largest industry, employing about 3 lakh workers (1946) that is, more than 50 per cent of the industrial workers of all types. Because of its importance in the economic structure of both West and East Bengal, a separate map has been prepared (Map 55). The manufacturing industries in Bengal can be broadly divided into three categories : those that are concerned with the processing of agricultural products ; those that manufacture other kinds of consumer goods ; and the extractive industries. The number of units in the first two categories amounted to a little over 2,000 in 1946, and there were 250 coal mines under the third category. The first category includes jute mills, cotton mills, rice mills, tea factories, oil and flour mills, and sugar mills and refineries. They employ more than 70 per cent of the total industrial workers. The second group of industries include iron and steel works, engineering establishments, railway workshops, ship repairing shops, paper mills, and factories, manufacturing matches, chemicals, cement glass, paints and soaps. The extractive industries are at present mainly concerned with the mining of coal, and the quarrying of different types of clays.

The map shows not only the distribution of different industrial units, but also the extent of areas dominated by a single industry like rice milling, tea, general engineering, printing presses and jute mills and presses. It is clear that factories are very unevenly distributed in Bengal. West Bengal has most of the industries, mainly in Calcutta and its neighbourhood. This area accounts for more than 56 per cent of the total factory establishments, and employs over 82 per cent of the total indus-

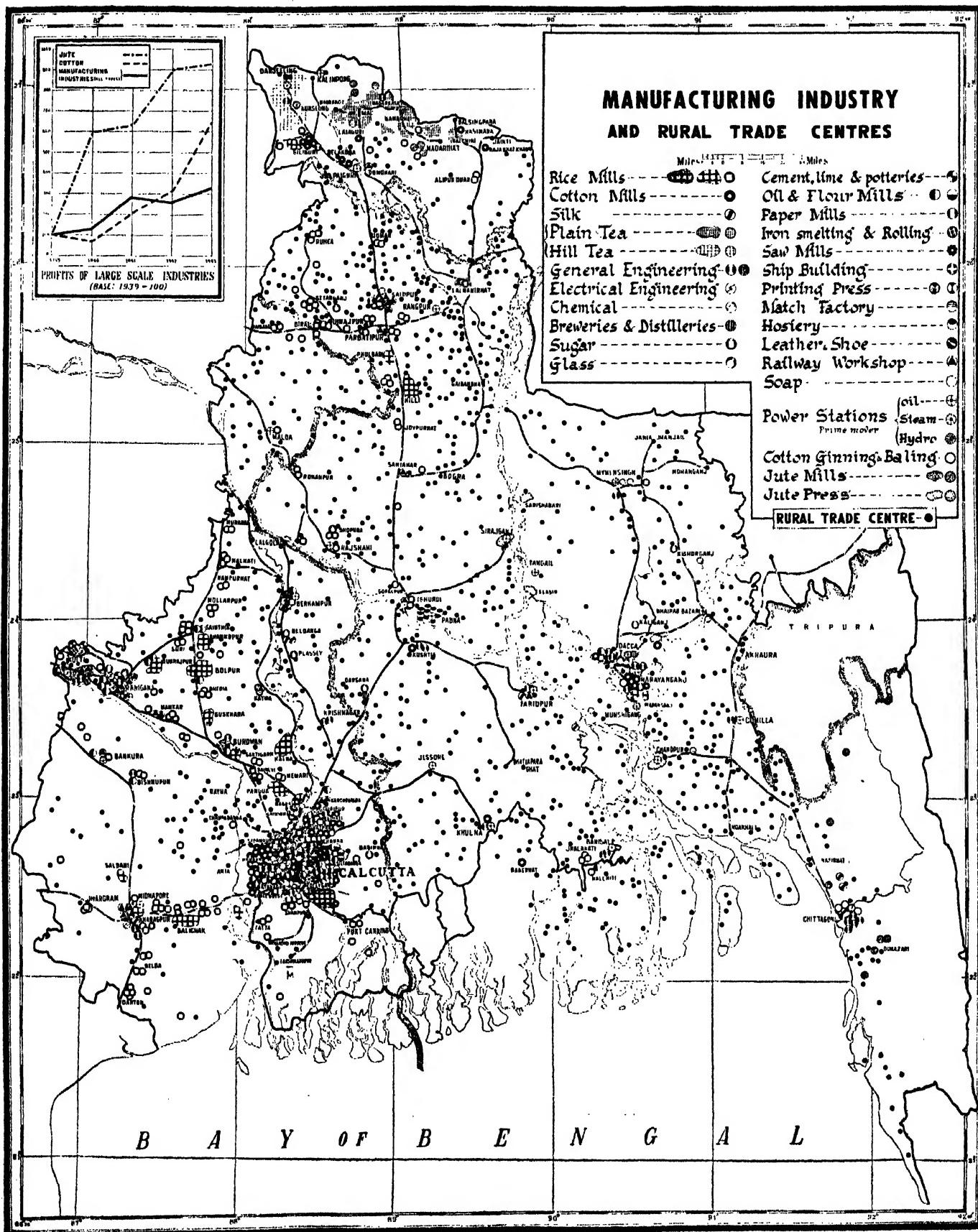
trial workers. This extreme congestion has made industry ill-balanced. Asansol is another important regional centre of diversified industries. The tea industry is mainly located in the northern part of West Bengal. Elsewhere in West Bengal rice milling is the only prevailing type of industry. East Bengal, on the other hand is poor in factory industry, and what industries have developed, are concentrated in the Dacca-Narayanganj area. Chittagong in the south and Saidpur in the north are the two other industrial centres of some importance. Elsewhere in East Bengal, the rice-milling industry is found in the north, and the jute-pressing industry in the jute-growing areas.

The absence of cheap power for industrial use is primarily responsible for the extreme localisation of industries in certain favourably situated areas. It is true that there are 23 towns with power stations, but most of them do not supply power at an economic price. The map shows the distribution of these types of power stations based on the prime movers—oil, steam or water. Most of the power stations in district towns are driven by diesel engines. The Hooghly industrial region and the Raniganj coal mining area use steam as the prime mover. It is only in the mountainous district of Darjeeling that power from running water is generated and consumed locally in tea factories.

In Bengal (1942) there were 33 cotton mills with 105,805 spindles and 10,712 looms, employing 24,169 workers daily. The principal centres of the cotton industry are Serampore (10 mills) and Howrah (14) in West Bengal, and Narayanganj (7) in East Bengal. In East Bengal Kushtia and Khulna also have cotton mills. The principal cotton-ginning and baling centres are Chittagong in East Bengal (4) and Cossipore in West Bengal (2). Most of the hosiery mills are situated near Calcutta. In East Bengal, Pabna is the most important centre of the hosiery industry. There are five silk mills, all in West Bengal (Murshidabad being the principal centre). Of the food industries, rice-milling is the most important. There are about 450 rice mills, employing some 17,000 workers. About 33 per cent of these are concentrated along the periphery of the Calcutta industrial region. Another 200 are to be found along the railways in the Burdwan division. Hilli is another important rice-milling centre, there being as many as

(Continued on page 94)

Map 73



THE HOOGHLY INDUSTRIAL REGION

MAP 74

The industrial maps of this region, including that of Calcutta, indicate the typical feature of the industrial structure of Bengal, namely, an extreme localization of large-scale industries along the banks of the Hooghly, stretching from Tribeni in the north to Birlapur in the south, through Calcutta and a large number of other towns. Here are to be found not only 90 per cent of the jute mills of India, but also the vast majority of the cotton and other mills of Bengal. Its total length following the meandering course of the Hooghly is about 45 miles. The railway lines may be taken as the western and eastern limits of this region. North of Calcutta the average width of the area is only 2 miles. The Hooghly river may appear to be the Indian counterpart of the Rhine-Ruhr valley of Germany. But most of the natural advantages that the Rhine valley enjoys are non-existent here. Coal from the nearby fields of Raniganj cannot be brought by waterways. Moreover, the industries in the Hooghly region, unlike those in Germany, have no deep roots. Neither the capital invested nor the labour employed is indigenous to Bengal. Most of the mills are owned and controlled by Europeans, and most of the workers are drawn from outside Bengal. It is then natural that such industries, however developed they may be, would fail to leave a permanent mark on the country where they thrive, and cannot be taken as a real index of the industrial prosperity of West Bengal.

There are four large power generating stations, situated at Cossipore, Gourepur, Garden Reach and

Mulajore, which supply power for industrial and domestic use at a price ranging from one-half to two annas per unit. The availability of cheap power has definitely influenced the growth of factory industries in this region, the other factors being (1) the proximity to a large city and port, (2) well developed waterways and rail-roads, and (3) the availability of banking facilities.

The jute mills are not evenly distributed throughout the entire stretch of this river. There are concentrations in five areas, besides scattered units. Three of these occur on the left bank of the Hooghly : Bhatpara-Jagatdal, Titagarh-Khardah, Budge-Budge—Birlapur and two on the right bank of the river : Champdany and Howrah. Jute presses and cotton-ginning and baling centres are mainly located at Cossipore near the terminus of the eastern canals. Cotton mills are confined to the right bank of the river, between Serampore and Fuleshwar. Large railway workshops have been established at Kanchrapara, and Santragachi. There is also a very large number of general engineering works round Calcutta and Howrah. Iron and steel rolling mills are located in Liluah, Belur and Howrah on the right bank of the river, and round Calcutta. Bengal's contribution to the all-India production of printing and writing paper is more than 50 per cent, and most of the paper mills are situated in this region at Titagarh and Naihati. Rubber goods are manufactured at Liluah, Howrah and Sahaganj, and paints at Shalimar and other centres.

COTTAGE INDUSTRIES

(Continued from page 86)

of workers, 11,339. The important centre are Khagra and Bishnupur in West Bengal, and Kagmari and Islampur in East Bengal. The cutlery industry is growing in importance. The products of this include agricultural implements, cooking utensils, tools and weapons. Kanchannagar (Burdwan) in West Bengal and Ramchandrapur (Tippera) in East Bengal are important centres.

The Pottery industry on a cottage basis includes earthen vessels of every day use, and toys of clay. Clay

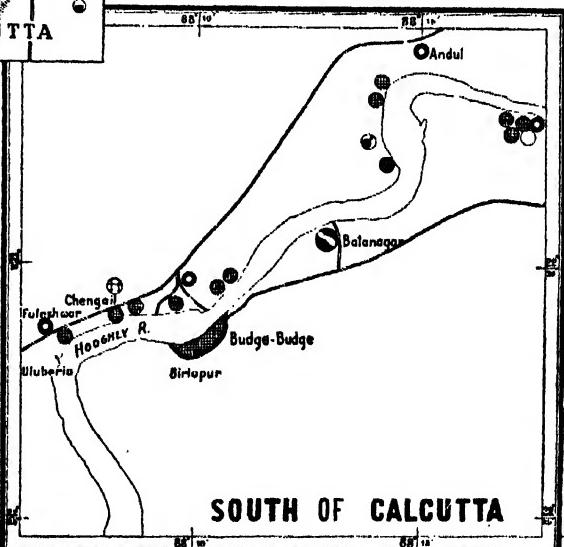
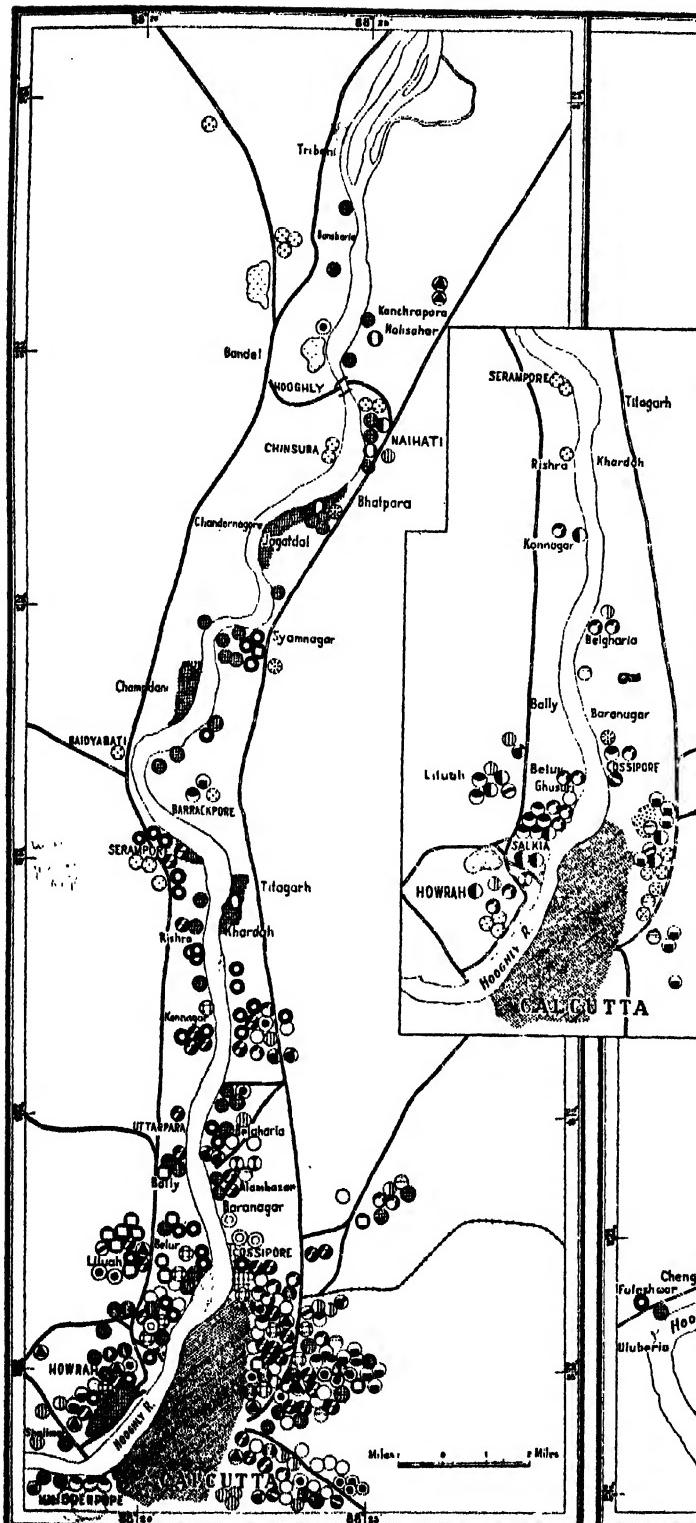
toys of Krishnagar are well-known throughout India, and are also exported abroad.

Mention may also be made of the *gur* (molasses) and *leather foot-wear* industries which could not be indicated on the map. The former is quite extensive, the estimated production being as much as 525,000 tons; whereas the latter is mainly confined in the city of Calcutta. The hand-made shoes of Calcutta have not only been successfully withstanding the competition of machine-made shoes for a long time but actually ousted them in the past.

Map 74

THE HOOGHLY INDUSTRIAL REGION

- (A) Railway Workshop
- (●●) Rice Mills
- (●) Chemicals
- (●●●) Jute Mills
- (□) Iron & Steel rolling
- (○) Paper Mills
- (○○) Jute Press
- (●) Cotton
- (○) " Ginning & Baling
- (●●) Flour Mills
- (●) Glass
- (●●) Tobacco
- (●●) Rubber
- (○○) Matches
- (●●) Oil Mills
- (●●) Hosiery
- (●●) Silk
- (●●) Saw Mills
- (●●) Leather & Shoe
- (○○) Tanneries
- (●●●) General Engineering
- (●●●) Power Generating
- (●●●) Shell Factory



Bally bridge?

MAP 75

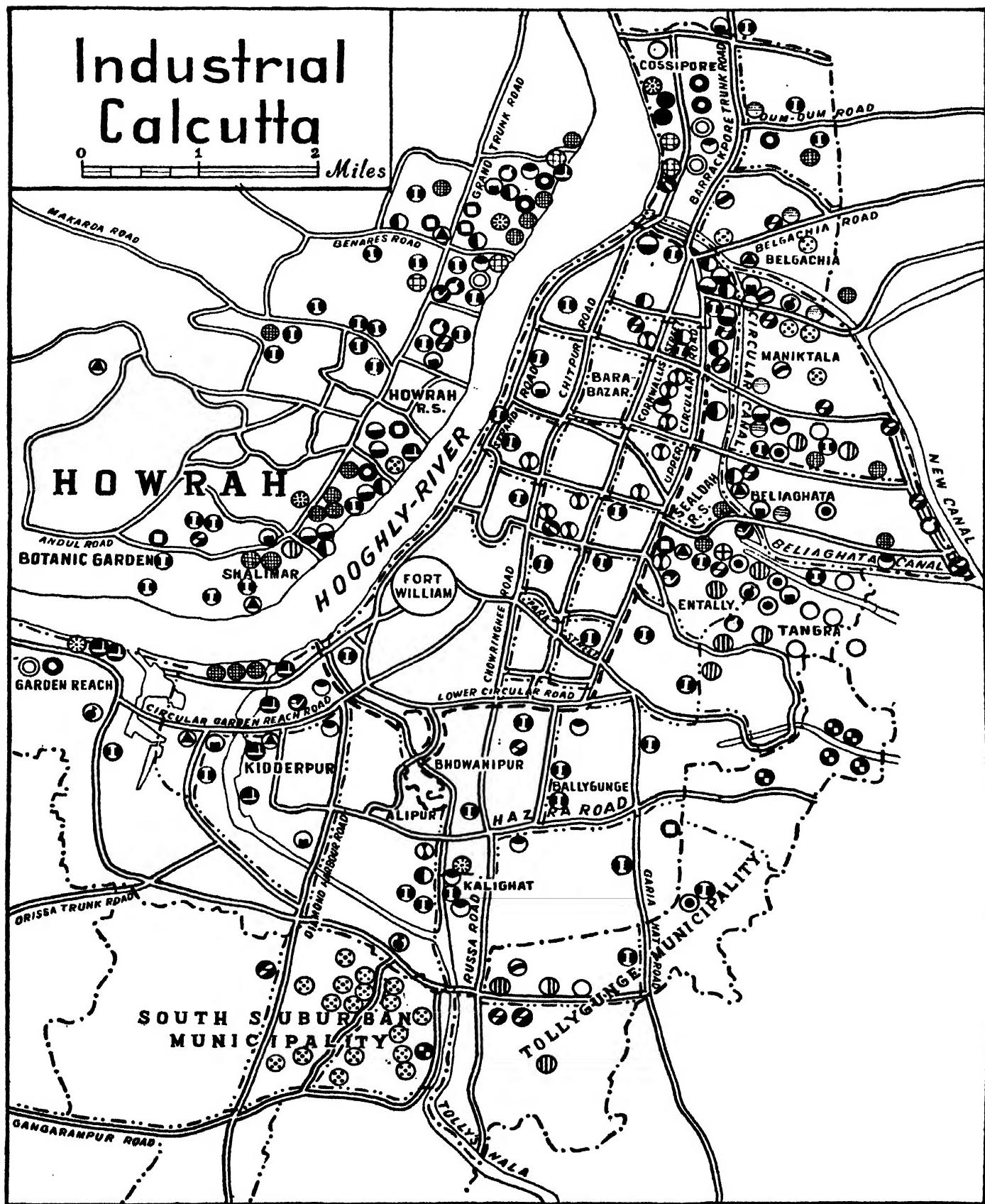
Calcutta. Calcutta proper has most of the printing and book-binding establishments, as this city is the largest educational and intellectual centre not only of Bengal but of India as a whole. The docks are at Kidderpore, down the river, and the ordnance factories are to the north of the city. Chemical works and glass factories have sprung up in the eastern part of the city. Of the food industries, flour and oil mills are found in the northern part, and rice mills in the southern part round Tollygunge.

THE CALCUTTA INDUSTRIAL REGION

- | | |
|-----------------------|------------------------|
| ◎◎ Rice Mills | ● Railway Workshop |
| ●● Jute Mills | ● Chemicals |
| ◎◎ Jute Press | ○ Iron & Steel rolling |
| ● Cotton Mills | ○ Paper Mills |
| ◎ " Ginnings & Baling | ○ Glass |
| ● Flour Mills | ● Rubber |
| ● Tobacco | ○ Matches |
| ● Soap | ● Oil Mills |
| ● Paint | ● Hosiery |
| ● Pottery & Cement | ● Silk |
| ● Brick-fields | ● Saw Mills |
| ●● Printing | ● Leather & Shoe |
| ● Docks | ○ Tanneries |
| ● Shell factory | ●● General Engineering |
| | ●● Power Generating |

Legend for the Map of Industrial Calcutta.

Map 75



THE RANIGANJ COAL MINING AND INDUSTRIAL REGION

MAP 76

This map shows the major portion of the Raniganj coalfield which lies in West Bengal. This area consists mainly of coal-bearing sedimentary rocks of the Gondwana system. The coal measures are of lower (Barakar) and upper Permian (Raniganj) age. In the western half of the coal-field, the coal-bearing strata outcrop on the surface, but in the east alluvium and laterites form a superficial covering to these beds. The Ajay and Damodar flow north and south of this field respectively, and the Barakar flows along its western border. All these three rivers flow through wide sand-filled channels, and hence their beds provide large quantities of sand for the sand-stowing of coal workings, thus eliminating the danger of land-subsidence in the neighbourhood of an exhausted mine. The innumerable tanks with which this area is dotted, mark the sites of abandoned quarry workings. The coal measures between the Barakar, Ajay and Damodar rivers cover an area of 424 square miles, and include the Ramnagar, Dishergarh, Salampur, Asansol, Gourangdi, Churulia, Charanpur, Kalipahari, Raniganj, Tapasi, Kendua, Ukhra and Kajora colliery areas. There are at present some 244 mines owned by 181 companies. Most of these concerns are too small to mechanise their mines, and resort to wasteful method of coal extraction.

The width of this field, measured from north to south, varies from about 12 miles in the west to about 19 miles in the east, and the length from the Barakar eastward is a little over 27 miles. The total output of coal of all grades during the years 1815-1947 is of the order of 200 million tons. According to the estimates of E. R. Gee the total reserves of metallurgical coal of all kinds amount to 82 million and 250 million tons within depths of 1,000 and 2,000 feet respectively, and the resources of superior quality non-metallurgical coal amount to 963 million, and 1,570 million tons within depths of 1,000 and 2,000 feet respectively. The resources of inferior quality coals are believed to be unlimited in so far as the coal-mining industry is concerned.

Sedimentary iron ores associated with shales also occur in this region, covering an area of about 44 square miles between the Barakar and Ajay rivers. The ores are in the form of bands of clay-ironstone. In 1913 roughly 7,000 tons of iron ore drawn from the Ironstone Shales were used annually in the furnaces at Kulti. Since 1914 clay ironstones are seldom utilized in the blast furnaces. That the iron ores of Bengal are lying idle will be evident from the following estimate made by David Smith in 1856 in the eastern part of Raniganj coal-field : "the deposits of this portion of the coal field would yield 6,400,000 tons of ore per square mile." The site of the original shaft near Barul has been marked on the map.

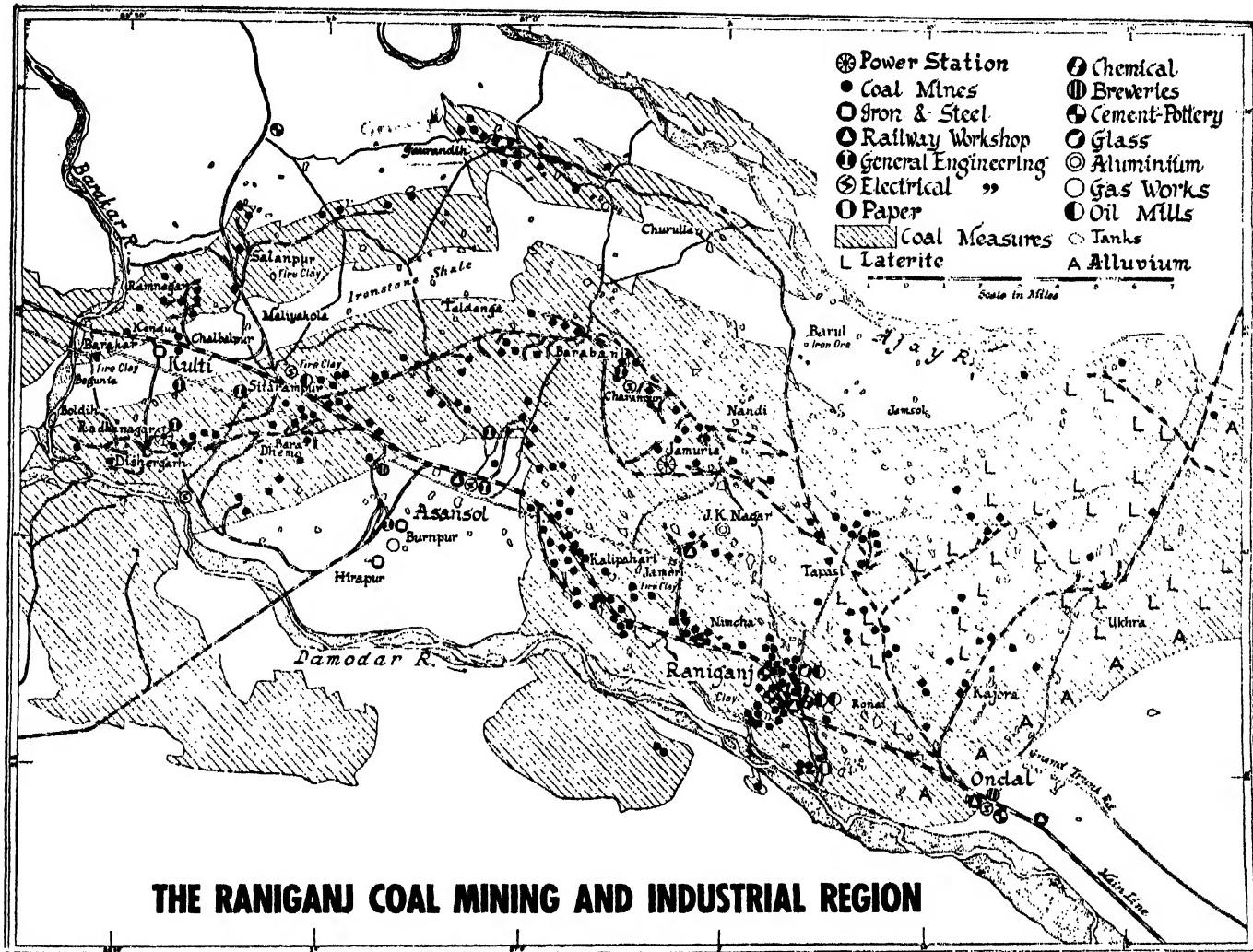
Hematitic clay-ironstones and ferruginous lateritic iron ores also occur in the eastern part of the field. Blanford also mentions the presence of 'very rich deposits of magnetic iron ore associated with metamorphic quartzite just beyond the south boundary of the field, near the village of Tituri, about 2 miles west of Beharinath Hill'.

This area is also rich in fire and other clays. The principal deposits of fire clays occur in vicinities of the Kudia nala, Damagaria, Radhaballavpur, Shyamdi-Pahargora, Ramdhora-Kantapahari, and Gar Dhemo-Churlia. These are used extensively in the manufacture of fire-bricks at Raniganj. Carbonaceous clays occur north-east of Raniganj near Ronei, and light-coloured clays at Durgapur, and there are extensive deposits of aggrillaceous alluvium throughout the field. These clays have given rise to a thriving brick, tile and stoneware pipe industry at Raniganj, Kulti and Durgapur. The coal-fields also contain dolomitic limestone near Ramlalpur, and tuffaceous and kankar deposits, which could be used as a flux in the manufacture of iron. There are also building stones (the massive sandstones of the Barakar measures), and road metal (doleritic dykes).

The presence of coal, iron ores and limestones led to the establishment of the first iron-works on modern lines at Kulti. Subsequently iron-works have been started at Hirapur and Burnpur (Napuria Iron-Works of the Steel Corporation of Bengal) near Asansol. The first two iron-works are under the management of the Indian Iron and Steel Company. The coal-field area generates enough electricity, mainly at Jamuria and Radhanagar near Dishergarh, to supply power in bulk to the coal-fields and various industrial concerns which have sprung up in this area. Asansol is the biggest town in this region. It has taken the place of Raniganj as the principal centre of the coal trade. Asansol also has the largest locomotive workshop in the world and there are large railway workshops at Ondal. Recently, aluminium extraction from bauxites has started north of Raniganj at J. K. Nagar (Anupnagar). Raniganj has also one paper mill, one large chemical works and a glass factory. There are also engineering works at Kulti, Sitarampur, Asansol, Charanpur and Raniganj. Sitarampur and Raniganj have several oil mills. Burn & Company have recently started their lime-works at Ondal. There is so far only one gas works, at Burnpur. This area is intersected by a network of roads and railways. The waterways need considerable development for the transportation of a bulky material like coal cheaply to other parts of India. In planning and development schemes for West Bengal this region should be given the first priority.

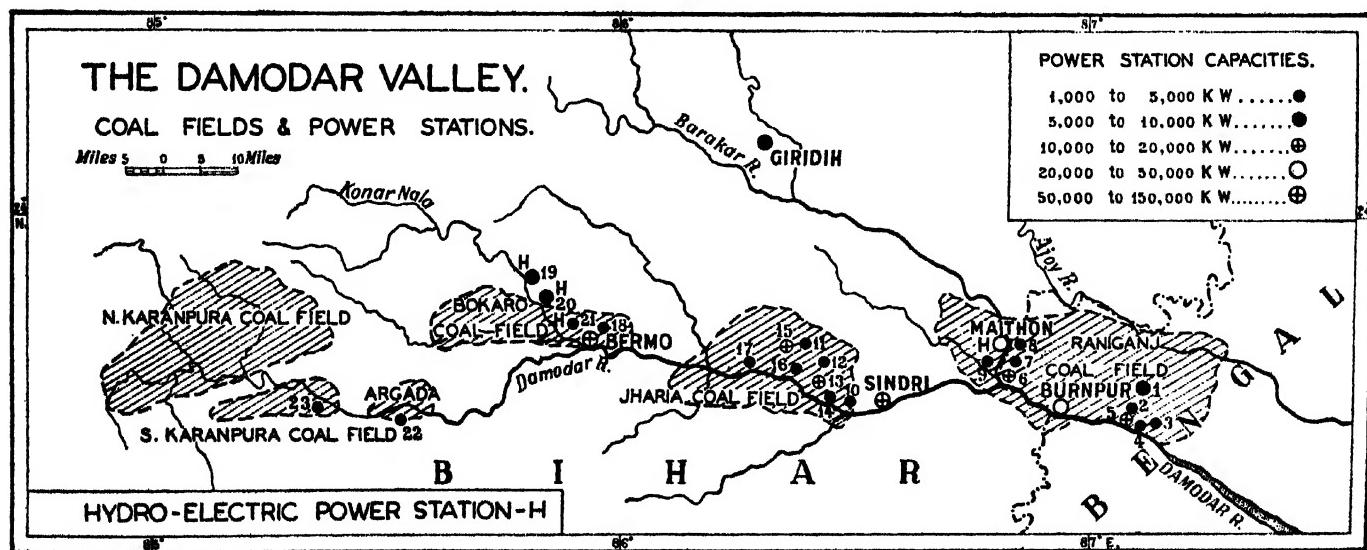
(Continued on page 98)

Map 76



THE RANIGANJ COAL MINING AND INDUSTRIAL REGION

Map 77



HIGH SCHOOLS

MAP 78

Apart from some well known and old established High Schools, a great deal of the secondary education of Bengal is still confined to small unaided private schools. Most of these schools are, however, recognised by the University of Calcutta permanently or provisionally so that they can prepare boys and girls for the Matriculation Examination of the University. Some 30,000 candidates appeared this year (1948) at the Matriculation Examination from West Bengal, and another 35,000 from East Bengal. The distributional map shows that High Schools are also located in rural areas, making secondary education accessible to children living in villages. The greatest concentration of High Schools, however, is found in and around Calcutta. According to the list published by the Government of Bengal in 1944 there were 129 High Schools in the city of Calcutta, 34 of which received aid from the Government.

In the present province of East Bengal there were 982 High Schools in that year (1944). Of these, 612 (aided—337; unaided—305) could be accurately located on the map. The greatest concentration in East Bengal occurs in the Dacca-Barisal area. There are areas on the outer fringe where very few high schools exist.

In West Bengal the schools are still less evenly distributed. Besides the Calcutta area, the Bhagirathi and Damodar valleys have some concentration of High Schools. There is a considerable dearth of schools in the Western and Northern parts of the province. The location of schools in West Bengal, as shown on the map is based on returns furnished by individual schools to the University of Calcutta after the partition of Bengal. The number of schools outside Calcutta was 560 (1948). Of these 444 (aided—196; unaided—248) could be accurately located on the map.

MANUFACTURING INDUSTRIES

(Continued from page 88)

17 rice mills in the town, and another 47 in the district. The tea and sugar industries employ labour only in certain months of the year. In Chittagong there are 15 tea factories, the remaining 277 are to be found in Darjeeling and Jalpaiguri districts. Of the 7 important factories manufacturing sugar in Bengal by the vacuum process, as many as 5 are situated in East Bengal. The largest of them, with a daily crushing capacity of 1,200 tons or over, are to be found at Darsana (Kushtia) and Gopalpur (Rajshahi).

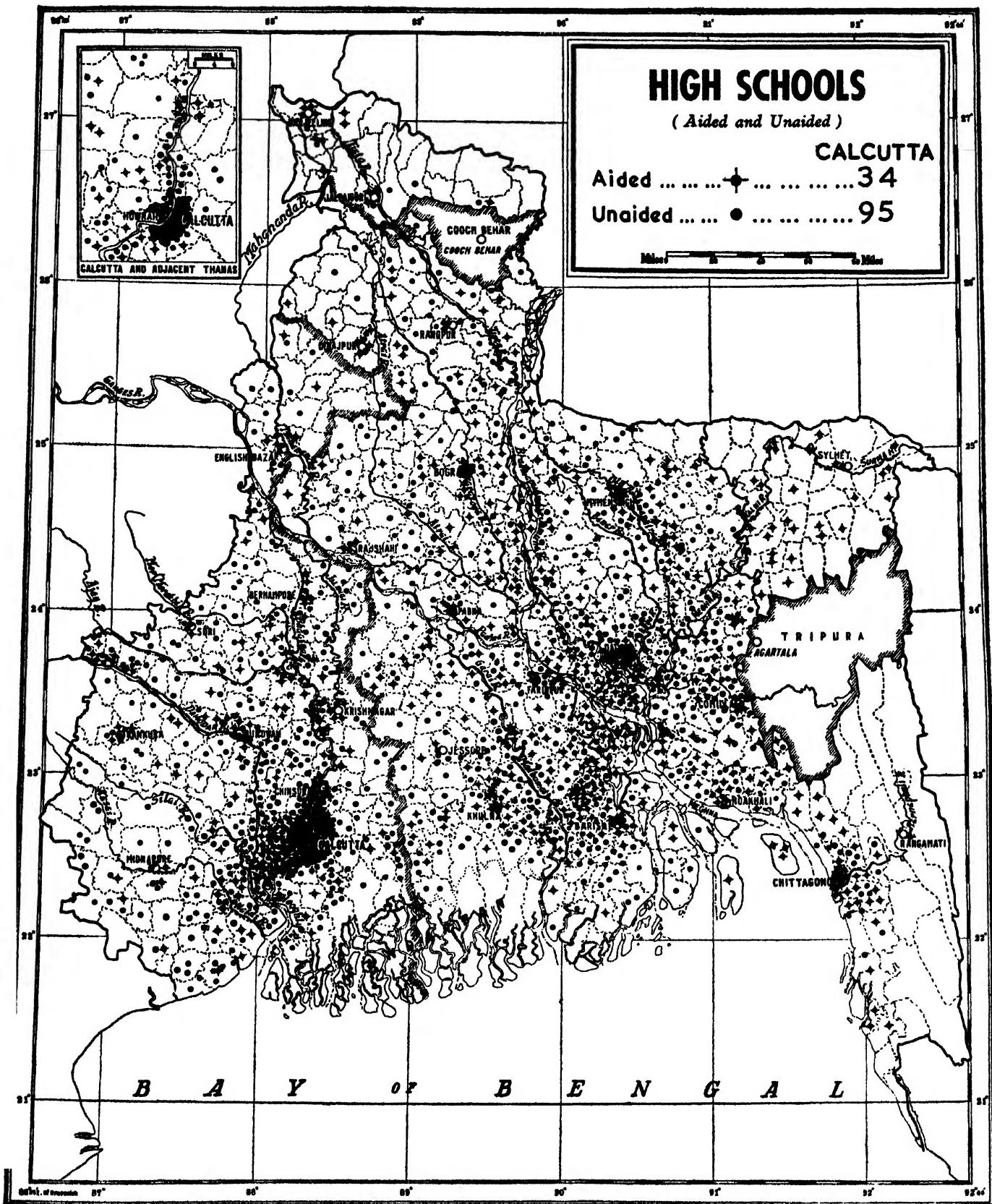
The railway workshops in Bengal manufacture many types of machinery, machine parts, and machine tools. Engineering firms (general and electrical) also manufacture certain types of machine and machine tools. In East Bengal there are 10 important railway workshops

as against 23 in West Bengal. The number of general engineering firms in East Bengal is about 20, and the corresponding number in West Bengal, 260.

RURAL TRADE CENTRES

The sale of local produce and the purchase of daily necessities take place at rural trade centres (locally called 'hats') which are ordinarily held once a week, but may in the more thickly populated areas be held twice a week. The attendance at these trade centres range from fifty to several thousands. From the map it appears that the number of such hats is greater in East than in West Bengal. In general, the villages away from railroads are linked together by a chain of local trade centres.

Map 78



MALARIA, OTHER DISEASES AND STARVATION

MAP 79

The Bhore Committee appointed by the Government of India in 1943 to survey the state of the public health in India reported 'India's death rates for the community as a whole and for infants rank high in comparison with the corresponding rates of most of the other countries.' What is true of India as a whole is more true of Bengal. There, as elsewhere in India, 'the low state of the public health is reflected in the wide prevalence of disease and the consequent high rates of mortality in the community as a whole, and in particular reproductive age period.' In an abnormal year like 1943, millions died of hunger and as victims of diseases. This map is based on figures furnished by the then Government of Bengal for the information of the members of the Legislative Assembly. The total number of deaths amounted to 18,66,295 in 1943. Deaths in East Bengal were more than twice the number in West Bengal. The map shows that the inhabitants of the densely populated parts were the worst sufferers. They were the people who lived at the subsistence level, and could not withstand the onset of the famine and its accompanying diseases, malaria and cholera.

The number of deaths compared to the population was the lowest in Malda and Dinajpur districts (13 per 1,000 population in the former, and 22, in the latter district). In West Bengal this number was the highest

in Birbhum and Bankura districts (39 per 1,000 in the former, and 31, in the latter). Jalpaiguri had also a high proportion (35 per 1,000). In East Bengal the number of deaths per 1,000 was the highest in Chittagong district (40 per 1,000), Rangpur and Tippera had the second highest figure (39 per 1,000), Khulna (28 per 1,000), Jessor (28 per 1,000) had the lowest number of deaths compared to total population.

Malaria

In Bengal the largest single cause of death is malaria. The inset map is based on a map prepared by the Malaria Institute of India. It shows that there are well-defined regions of malaria endemicities in the province. The hyper-endemic areas with a spleen rate over 60 per cent comprise the Tarai in Jalpaiguri district, the damp valleys in Tripura State and the Chittagong Hill Tracts, and the waterlogged areas of Nadia and Jessor, including adjoining portions of the neighbouring districts. The areas of low endemicity with a spleen rate under 10 per cent include those regions in East Bengal which are drained and flooded by the living rivers of Bengal. The rest of Bengal is moderately to highly endemic in character, the intensity of the fever depending on local conditions.

THE DAMODAR VALLEY

MAP 77

(Continued from page 91)

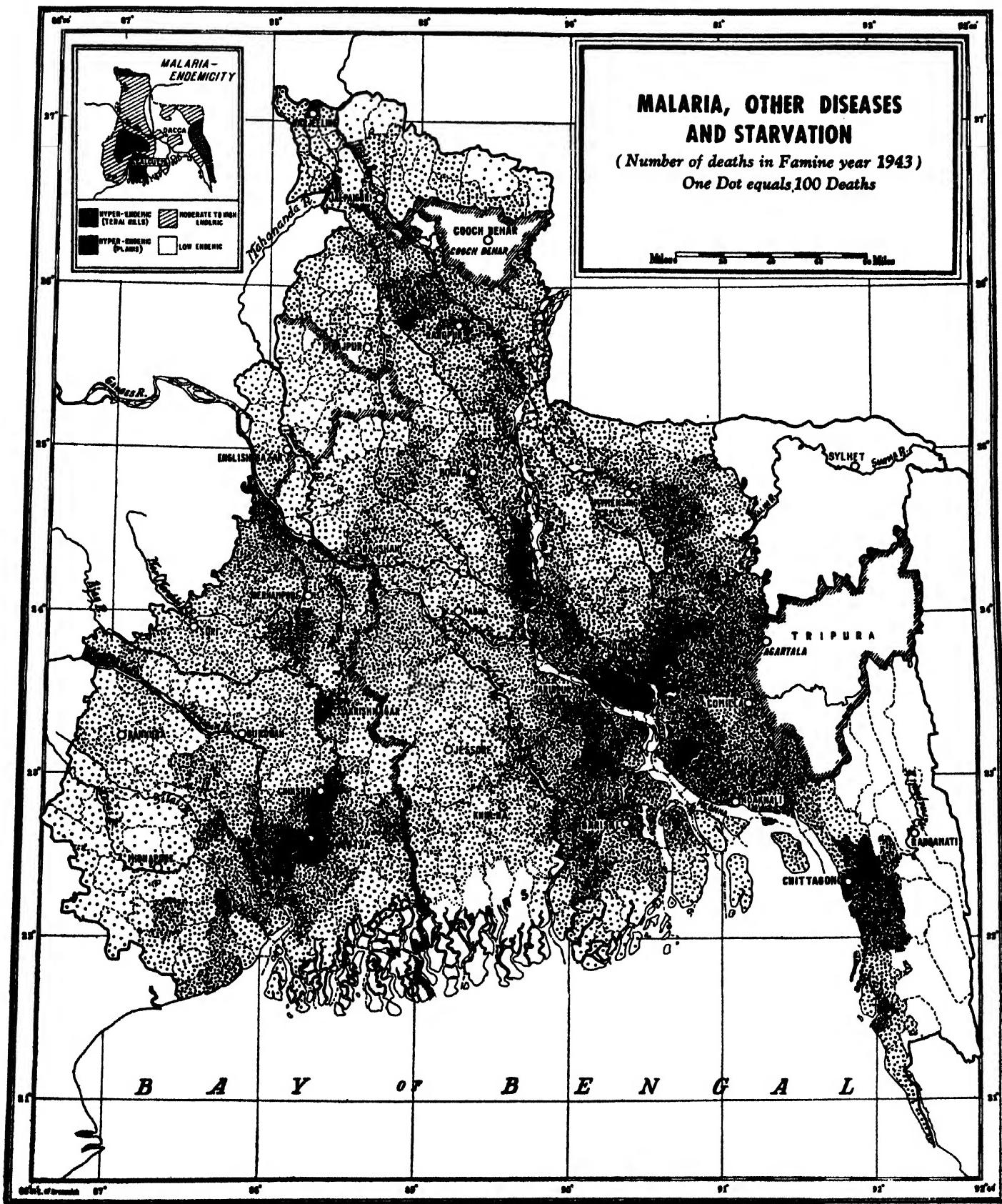
This map of the Damodar Valley is based on the 70-mile Power Map of India, first edition 1947. It shows not only the whole of the Raniganj coalfield, but also the adjoining Gondwana coalfields in the province of Bihar. The map also shows the power stations bigger than 1,000 K.W., existing and projected before September, 1946. One of the greatest experiments in socio-economic planning is being staged at the moment in this valley by the Damodar Valley Corporation, set up by the Central Government of India. The provincial governments of West Bengal and Bihar are also

financing the scheme. Like the T.V.A. of the United States the D.V.C. of India is actively engaged in utilising fully the water resources of the valley, so that soil erosion and devastating floods could be prevented, a navigation channel through the coalfields could be opened up, cheap power could be generated, water for irrigation could be provided, and afforestation could be started. It may be interesting to compare this map with a new map of the developed Damodar valley project.

POWER STATIONS :

1. Sibpore; 2. Kalipahari; 3. Bengal Paper Mills (Raniganj); 4. Refractory & Ceramic Factory (Raniganj); 5. Anupnagar (J. K. Nagar); 6. Dishergarh; 7. Kulti; 8. Victoria Colliery; 9. Kumar dhobi; 10. Chasnala; 11. Kendwadih; 12. Hurriladih; 13. Jamadoba; 14. Bhowra; 15. Loyabad; 16. Jitpur; 17. Mahuda; 18. Kargali; 19, 20 & 21. Konar (Hydro-Electric Projected); 22. Ramgarh; 23. Bhurkunda.

Map 79



ROADS, RAILWAYS, WATERWAYS AND TOWNS

MAP 80

The folder map shows the cultural landscape of Bengal. The system of communication has been one of the weakest points in the economic organisation of the province. The partition of Bengal has made the problem still more difficult to solve, as seldom does the new frontier line run along a communication divide.

The longest and perhaps the busiest railway line in Bengal, which extends from Calcutta to Siliguri, has now been cut into three sections, the first and the last sections including the two terminals lying in West Bengal, and the major portion, in East Bengal. The most important transverse line in the north, which runs through Parvatipur, and the two other short transverse lines elsewhere, have been likewise affected. In the northern part of Bengal several longitudinal highways like the Malda and Murshidabad roads have now to cross the international boundary at several points. Dinajpur has, therefore, lost to a certain extent its importance as a nodal town. South of the Padma the boundary line also cuts across several important transverse roads. Of these, the Jessore road is the most important.

The inland waterways (mainly the Ganges-Padma and the Canal routes between Calcutta and Barisal), carrying agricultural products from rural east to industrial west, and coal and manufactured goods in a reverse direction, will now have to operate under newly created handicaps.

According to the Comprehensive Report on the Road Development of Bengal (1938) there were 19,303 miles of roads, and 3,342 miles of railroads in undivided Bengal. They were distributed in the two parts as follows :

| | Railroads | Roads |
|-----------------|-------------|-------------|
| West Bengal . . | 1,900 miles | 8,512 miles |
| East Bengal . . | 1,442 " " | 10,791 " |

Roads

In Bengal as elsewhere the natural landscape has considerably influenced the density of the road net. It is definitely longer in West Bengal than in East Bengal, as shown on the map. The western part of the West Bengal has a moderate relief, providing favourable conditions for road development. It is unfortunate that

many of the important ancient highways like the old Rangpur road in the north, and the Burdwan road in the south have been allowed to decay. The Grand Trunk Road is by far the most important highway connecting Calcutta with its productive hinterland. Since the greater part of East Bengal is in extreme physiographic youth, the drainage is imperfect, and during the rainy season much of the country goes under water, and become impassable except by boat. That is why rural East Bengal lacks good hard-surfaced roads. In the eastern border of the province, however, the country is undulating and is served by good highways like the Dacca-Chittagong Trunk Road. Several hard-surfaced roads were built during the war years for strategic reasons.

Railways

Bengal does not have a dense railway network comparable to those of the progressing countries of Europe and North America. The railways, though inadequate, are partly responsible for the decay of important highways and waterways of the province. The lines, wherever feasible, follow the ancient highways, and could easily compete with them, because of the absence of motor transportation on most of these roads. The earliest railroad in Bengal was built in 1854 from Calcutta to Hooghly along the left bank of the Ganges (the Hooghly), and was extended to Raniganj one year later in response to the demand for coal. Railroad development in this part of Bengal did not begin in earnest until 1879, when the management of the railways was entrusted by the then Government to a newly formed railway company—the East Indian Railway. The denser portions of the railroad net are in the neighbourhood of Calcutta. The south-western part of West Bengal is served by the Bengal Nagpur Railway, which connects Calcutta with South and Central India. East of Calcutta runs the East Bengal Railway, which before partition was known as the Bengal Assam Railway. It taps the agricultural regions of north and east. In this part of the province the first railroad started functioning in 1862 between Calcutta and Kushtia, the latter terminal then standing on the right bank of the Padma. The idea of building a railway bridge over the Padma at Kushtia was abandoned with the shifting

of the river, and hence the line could not be extended to Dacca. In 1871 the line was, however, extended to Goalundo, which gradually developed into an important terminal for river steamers. Two other lines, Calcutta to Canning, and Calcutta to Diamond Harbour then appeared in answer to a demand for shifting the harbours from Calcutta to some better sites. The railroad construction was undertaken in North Bengal as a result of the terrible famine that devastated the country-side during 1875-77. It was felt that a rapid transport of food grains was necessary in order to supply food to the famine-stricken population. In 1884 the longitudinal line (metre gauge) between Sara and Siliguri, and the short transverse line (metre gauge) between Kaunia and Dinajpur via Parvatipur began to function. The metre gauge railway between Sara and Siliguri was converted into a broad gauge much later, and in 1915 a railway bridge was constructed at an enormous cost over the Padma near Paksey (the Hardinge bridge) to avoid the delay in transhipment.

The railway nets end abruptly eastward in front of the broad rivers—the Brahmaputra (the modern Jamuna), the Ganges (the Padma) and the Meghna. East of this barrier run several metre gauge lines, forming a separate railway net. The first line of the network was built between Narayanganj and Mymensingh via Dacca. The heavy cost of construction due to the presence of innumerable wide rivers, and the lack of coal are real handicaps to railway development in East Bengal.

Waterways

In a deltaic country like Bengal rivers and canals constitute magnificent systems of inland water transportation. East Bengal is definitely better situated in this respect than West Bengal. Navigation on the three big rivers of East Bengal—the Padma (Ganges), the Brahmaputra (the Jamuna) and the Meghna was developed in early times. To-day, these rivers are open to steamer traffic at all seasons of the year, and thus help in the cheap transport of bulky agricultural products from growing areas to consuming centres. The steamer service between Barisal and Chittagong via Bhola and islands of Hatia and Sandwip is one of the cheapest routes for the transport of goods. Ocean liners make a regular call at Chittagong.

The West Bengal rivers used to carry a considerable trade in the past, but the channels have deteriorated to such an extent that most of them are useless to-day as navigable rivers. The Hooghly channel has, however, been kept open for ocean liners as far as the Garden Reach, a suburb of Calcutta. There was a time when

ocean vessels could go as far as Hooghly and Chinsurah towns. On the map are shown three important waterways connecting Calcutta with East Bengal agricultural plains. Of these, the circular and Eastern canal is 1,127 miles long, one of the longest inland waterways of the world.

Towns

The distribution of functional towns has been indicated on the same map. Some of the functional villages, which may develop one day into towns have also been included. Frontier villages along the present international boundary have also been located on the map. The two sea ports of Bengal—Calcutta in West Bengal and Chittagong in East Bengal, have adequate contacts with their rich and extensive hinterlands, and, therefore, share not only sea trade but rail and river traffic as well. Calcutta has many other functions. It owes its present prosperity to trade and commerce, which are the dominant economic activities. It is also an industrial city, and one of the most important cultural centres of Bengal. Dacca was the second largest city of undivided Bengal. It also combines many functions, and now that it has become the capital of Eastern Pakistan, its growth is expected to be rapid. The second largest city of West Bengal is Bhatpara which is highly industrialized. The other industrial towns are mainly located along a narrow longitudinal belt following the Hooghly river between Tribeni and Budge-Budge. These may appear to be satellite towns of Calcutta, but, in reality, some of them, especially in the northern portion of the belt were in existence long before the city of Calcutta was founded. The mining towns have sprung up in the Raniganj coal mining area of West Bengal. They have industries as well. Most of the important river ports are located in East Bengal. Narayanganj on the Lakhya river is perhaps the busiest river port of Bengal. It is a focus of important waterways and is also rapidly developing into a large industrial centre. The second largest river port is Sirajganj, which stands on the right bank of the Brahmaputra (the Jamuna). Khulna, Barisal and Chandpur are the other important foci of waterways in East Bengal. Most of the railway towns are on the main railway line from Calcutta to Siliguri. They contain either railway workshops: Kanchrapara and Saidpur, or, are important railway junctions—Parvatipur and Ranaghat. Most of the district and sub-divisional headquarters are also commercial towns, and some of them like Chandpur and Sirajganj are important river ports as well. Such towns have been shown on the map by combining the two symbols of their dominant economic activities.

APPENDIX

[List of Police-Stations (Thanas) arranged under subdivisions of each district. See Map 3 for their location]

WEST BENGAL

BURDWAN

Asansol

1. Salanpur.
2. Kulti.
3. Barabani.
4. Asansol.
5. Jamuria.
6. Raniganj.
7. Ondal.
8. Faridpur.
9. Kaksa.

Sadar

10. Ausgram.
11. Bhatar.
12. Galsi.
13. Burdwan.
14. Memari.
15. Khondaghosh.
16. Raina.
17. Jamalpur (Moyna).

Katwa

18. Ketugram.
19. Mongolkot.
20. Katwa.

Kalna

21. Monteswar.
22. Furbasthali.
23. Kalna.

BIRBHUM

Rampurhat

1. Muraroj.
2. Nalhati.
3. Rampurhat.
4. Mayureswar.

Sadar

5. Muhammad Bazar.
6. Rajnagar.
7. Suri.
8. Sainthia.
9. Labhpur.
10. Khoyrasole.
11. Dubrajpur.
12. Illambazar.
13. Bolpur.
14. Nanoor.

BANKURA

Sadar

1. Saltora.
2. Mejhia.
3. Chatna.
4. Gangajalghati.
5. Borjora.
6. Bankura.
7. Indpur.
8. Onda.
9. Khatra.
10. Taldangra.
11. Simlapal.
12. Ranibandh.
13. Raipur.

Bishnupur

14. Sonamukhi.
15. Bishnupur.
16. Patrasair.
17. Joypur.
18. Indas.
19. Kotalpur.

MIDNAPORE

Jhargram

1. Binpur.
2. Jamboni.
3. Jhargram.
4. Gopiballavpur.
5. Nayagram.

Sadar

6. Garhbeta.
7. Salbani.
8. Keshipur.
9. Midnapore.
10. Debra.
11. Kharagpur Town.
12. Kharagpur.
13. Pingla.
14. Keshiary.
15. Narayanganj.
16. Sabang.
17. Dantan.
18. Mohanpur.

Ghatal

19. Chandrakona.
20. Ghatal.
21. Daspur.

Tamluk

22. Panskura.
23. Tamiluk.
24. Moyna.

Contai

25. Mahishadal.
26. Sutahata.
27. Nandigram.
28. Patashpur.
29. Bhagwanpur.
30. Egra.
31. Khejri.
32. Contai.
33. Ramnagar.

HOOGHLY

Arambagh

1. Goghat.
2. Arambagh.
3. Pursoora.
4. Khanakul.

Sadar

5. Pandua.
6. Balagarh.
7. Dhaniakhali.
8. Polba.
9. Magra.
10. Chinsura.

Serampore.

11. Tarakeswar.
12. Jangipara.
13. Haripal.
14. Singur.
15. Chanditala.
16. Bhadreswar.
17. Serampore.
18. Uttarpara.

HOWRAH

Uluberia

1. Amita.
2. Bagnan.
3. Uluberia.
4. Bowria.
5. Shyampur.

Sadar

6. Jagatballavpur.
7. Domejur.
8. Bally.
9. Panchla.
10. Sankrail.
11. Jagacha.
12. Howrah City.

24-PARGANAS

- #### *Barrackpore*
1. Bijpur.
 2. Naihati.
 3. Jagatdal.
 4. Noapara.
 5. Barrackpore.
 6. Titagarh.
 7. Khardah.
 8. Baranagar.
 9. Dum Dum.

(Alipore)

- #### *Sadar*
10. Metiabruz.
 11. Maheshtola.
 12. Behala.
 13. Tollygunge.
 14. Budge-Budge.
 15. Bishnupur.
 16. Sonarpore.
 17. Bhangar.
 18. Baruipur.
 19. Jayanagar.
 20. Canning.

Barasat

21. Amdanga.
22. Habra.
23. Barasat.
24. Deganga.
25. Rajarhat.

Basirhat

26. Sarupnagar.
27. Baduria.
28. Basirhat.
29. Haroa.
30. Sandeshkhali.
31. Hasnabad.

Diamond Harbour

32. Falta.
33. Magrahat.
34. Diamond Harbour.
35. Kulpi.
36. Mathurapur.
37. Kakdwip.
38. Sagar.

NADIA (NABADWIP)*Mcherpur*

7. Karimpur.
9. Tehatta.

Chuadanga

14. Krishnaganj.

Sadar

16. Kaliganj.
17. Nakasipara.
18. Chapra.
19. Nabadwip.

*Krishnagar.**Ranaghat*

21. Hanskhali.
22. Santipur.
23. Ranaghat.
24. Chakdah.
25. Haringhata.

Bongaon (now in Barasat subdivision
24-Parganas.)

7. Bongaon.
9. Gaighata.

MURSHIDABAD*Jangipur*

1. (a) Farakka.
1. (b) Samserganj.
2. Suti.
3. Raghunathganj.
4. Sagardighi.

Lalbagh

5. Lalgola.
6. Nahagram.
7. Jiaganj.
8. Bhagabangola.
9. Murshidabad.
10. Raninagar.

Sadar

11. **Baharampur Town.**
12. Beldanga.
13. Hariharpara.
14. Naoda.
15. Domkol.
16. Jalangi.

Kandi

17. Khargram.
18. Kandi.
19. Burwan.
20. Bharatpur.

WEST DINAJPUR

- Sadar and Balurghat*
11. Raiganj.
12. Itahar.
13. Hemitabad.
14. Kaliaganj.
15. Kushumardi.
16. Banshkhali.
23. Gangarampur.
24. Kumarganj.
26. Tapan.
27. **Balurghat.**

JALPAIGURI

- Sadar*
5. Raiganj.
6. **Jalpaiguri.**
7. Mal.
8. Mitali.
9. Maynaguri.
10. Nagrakata.
11. Dhubguri.

Alipur

12. Madarihat.
13. Falakata.
14. Kalchini.
15. Alipur Duars.
16. Kumargram.

DARJEELING*Sadar*

1. Pulbazar.
2. Sukhiapokri.
3. Darjeeling.
4. Jore Bungalow.
5. Rangli Rangliot.

Kurseong

6. Mirik.
7. Kurseong.

Siliguri

8. Khoribari.
9. Siliguri.
10. Phansidewa.

Kalimpong

11. Kalimpong.
12. Gorubathan.

MALDA

1. Harischandrapur.
2. Kharba.
3. Katua.
4. Gajole.
5. Bamangola.
6. Manikchak.
7. English Bazar.
8. Malda.
9. Habibpur.
10. Kaliachak.

N. B. Part of Daulatpur Thana (Nadia) included in West Bengal.

EAST BENGAL**KUSHTIA (formerly NADIA)***Sadar*

1. Daulatpur.
2. Bhairamara.
3. Mirpur.
4. **Kushtia.**
5. Kunarkhali.
6. Khoksa.

Mcherpur

8. Gangani.
10. Meherpur.

Chuadanga

11. Alaudanga.
12. Damurhuda.
13. Chuadanga.
15. Jibannagar.

JESSORE*Jhenida*

1. Harinakundu.
2. Saikopa.
3. Jhinaidaha.
4. Kotchandpur.
5. Kaliganj.

Bongaon

6. Maheshpur.
8. Sarsa.

Sadar

10. **Jessore.**
11. Bagherpara.
12. Jhikargacha.
13. Manirampur.
14. Abhoynagar.
15. Keshabpur.

Magura

16. Sripur.
17. Magura.
18. Salikha.
19. Muhammadpur.

Narail

20. Alfadanga.
21. Lohagara.
22. Narail.
23. Kalia.

KHULNA*Satkira*

1. Kalaroa.
2. Satkira.
3. Tala.
4. Debhatta.
5. Kaliganj.
6. Asasuni.
7. Shyamnagar.

Sadar

8. Fultola.
9. Daulatpur.
10. Tarakhada.
11. Damuria.
12. **Khuina.**
13. Batiaghata.
14. Paikgacha.
15. Dacope.

Bagerhat

16. Mollahat.
17. Fakirhat.
18. Bagerhat.
19. Kachua.
20. Morelganj.
21. Rampal.
22. Sarankhola.

RAJSHAHI*Naogaon*

1. Niamatpur.
2. Mahadeppur.
3. Badalgachi.
4. Manda.
5. Naogaon.
6. Raninagar.
7. Atrai.

Sadar

8. Tanor.
9. Mohanpur.
10. Bagmara.
11. Godagari.
12. Paba.
13. Durgapur.
14. Puthia.
15. Boalia.
16. Charghat.

Nator

17. Singra.
18. Nator.
19. Gurudaspur.
20. Baraigram.
21. Lalpur.
22. Bagatipara.

DINAJPUR**Thakurgaon**

1. Atwari.
2. Baliadangi.
3. Thakurgaon.
4. Ranisankail.
5. Pirganj.
6. Birganj.
7. Haripur.
8. Bochaganj.
9. Kasharul.
10. Khansama.

Sadar

17. Biral.
18. **Dinajpur.**
19. Chirirbandar.
20. Parbatipur.
21. Nawabganj.
22. Ghoraghata.

Balurghat

25. Phulbari.
28. Porsha.
29. Patnitala.
30. Dhamoirhat.

JALPAIGURI**Sadar**

1. Tectulia.
2. Pachagar.
3. Boda.
4. Debiganj.
17. Pathgram.

RANGPUR**Nilphamari**

1. Domar.
2. Dimla.
3. Nilphamari.
4. Jaldhaka.
5. Saidpur.
6. Kishoreganj.

Sadar

7. Hatibandha.
8. Gangachara.
9. **Rangpur (Kotwali).**
10. Kaliganj.
11. Kaunia.
12. Pirgacha.
13. Mitapokhar.
14. Pirganj.
15. Badarganj.

Kurigaon

16. Bhurangamari.
17. Nageshwari.
18. Pulbari.
19. Lalmonirhat.
20. Kurigaon.
21. Ulipur.
22. Chilmari.
23. Rahumari.
24. Sundarganj.
25. Sadullapur.
26. Gaibandha.
27. Palashbari.
28. Gobindganj.
29. Shaghata.
30. Fulchuri.

BOGRA

1. Panchbibi.
2. Joypurhat.
3. Khetlal.
4. Sibganj.
5. Adamdighi.
6. Dupchanchia.
7. Kahalu.
8. **Bogra.**
9. Gabtali.
10. Shariakandi.
11. Nandigram.
12. Sherpur.
13. Dhunot.

PABNA

- Sirajganj**
1. Kazipur.
2. Taras.
3. Rayganj.
4. Sirajganj.
5. Ullapara.
6. Kamarkhanda.
7. Belkuchi.
8. Shazadpur.
9. Chauhali.

Sadar

10. Chatmohar.
11. Faridpur.
12. Sara.
13. Atgharia.
14. **Pabna.**
15. Santhia.
16. Sujanagar.
17. Bera.

MALDA

11. Bholahat.
12. Gomstapur.
13. Sibganj.
14. Nachole.
15. Nawabganj.

DACCA**Sadar**

1. Sripur.
2. Kapasia.
3. Kaliakoir.
4. Dhamrai.
5. Sabhar.
6. Joydebpur.
7. Kaliganj.
8. Tezgaon.
9. **Dacca City.**
10. Keraniganj.
11. Nawabganj.
12. Dohar.

Narayanganj.

13. Monohardi.
14. Sibpur.
15. Raipura.
16. Narsingdi.
17. Rupganj.
18. Araihazar.
19. Baidyabazar.
20. Narayanganj.
21. Fatulla.

Munshiganj.

22. Serajdikhan.
23. Srinagar.
24. Lohajang.
25. Tangibari.
26. Munshiganj.

Manikganj

27. Daulatpur.
28. Saturia.
29. Sibalay.
30. Ghior.
31. Harirampur.
32. Manikganj.
33. Singair.

MYMENSINGH**Jamalpur**

1. Dewanganj.
2. Sribardi.
3. Nalitabari.
4. Islampur.
5. Sherpur.
6. Nokla.
7. Madarganj.
8. Melandaha.
9. Jamalpur.
10. Sarishabari.

Tangail

11. Madhupur.
12. Gopalpur.
13. Ghatail.
14. Kalibati.
15. Tangail.
16. Basail.
17. Nagarpur.
18. Mirzapur.

Sadar

19. Haluaghat.
20. Phulpur.
21. Muktagacha.
22. **Mymensingh.**
23. Iswarganj.
24. Phulbaria.
25. Trisal.
26. Nandail.
27. Bhaluka.
28. Gaffargaon.

Netrakona

29. Durgapur.
30. Kalmakanda.
31. Purbadhalia.
32. Netrakona.
33. Barhatta.
34. Atpara.
35. Mohanganj.
36. Kendua.
37. Madan.
38. Khalajuri.

Kishoreganj

39. Tarail.
40. Itna.
41. Hossainpur.
42. Kishoreganj.
43. Karimganj.
44. Pakundia.
45. Kathiadi.
46. Nikli.
47. Astagram.
48. Bajitpur.
49. Kuliarchar.
50. Bhairabazar.

FARIDPUR*Goalundo*

1. Pangsa.
2. Baliakandi.
3. Goalundo.
4. Goalundo Ghat.

Sadar

5. Faridpur.
6. Char Bhadrason.
7. Bhinsna (Boalmari).
8. Nagarkanda.
9. Sadarpur.
10. Bhanga.

Gopalganj

11. Maksudpur.
12. Kastiani.
13. Gopalganj.
14. Kotalipara.

Madaripur

15. Sibchar.
16. Janjira.
17. Rajair.
18. Madaripur.
19. Palong.
20. Naria.
21. Kalkini.
22. Bhedarganj.
23. Gosairhat.

BAKARGANJ*Sadar*

1. Gaurnadi.
2. Uzirpur.
3. Muladi.
4. Hizla.
5. Babuganj.
6. Mchindiganj.
7. Jhalakati.
8. Barisal
9. Rajapur.
10. Nalchiti.
11. Bakarganj.

Dakshinshahabazpur (Bhola)

12. Bhola.
13. Daulatkhan.
14. Baranadi.
15. Lalmohan.
16. Tazumaddin.

Patuakhali

17. Betagi.
18. Mirzaganj.
19. Patuakhali.
20. Bauphal.
21. Barguna.
22. Amtoli.
23. Galachipa.
24. Kalapara.

Pirojpur

25. Nazirpur.
26. Banaripara.
27. Swarupkati.
28. Kowkhali.
29. Pirojpur.
30. Bhandaria.
31. Kathalia.
32. Mathbaria.
33. Bamma.
34. Patharghata.

TIPPERA

- Brahmanbaria*
1. Nasirnagar.
 2. Sarail.
 3. Brahmanbaria.
 4. Nabinagar.
 5. Kasba.
 6. Bancharampur.

Sadar

7. Ilomma.
8. Muradnagar.
9. Daudkandi.
10. Debdaur.
11. (a) Chandina.
11. (b) Barura.
12. Burichang.
13. Comilla.
14. Laksam.
15. Chaudagram.

Chandpur

16. Matlabhazar.
17. Kachua.
18. Hajiganj.
19. Faridganj.
20. Chandpur.

NOAKHALI*Sadar*

1. Raipur.
2. Ramganj.
3. Lakshminpur.
4. Beganganj.
5. Senbagh.
6. Sudharam.
7. Noakhali.
8. Companyganj.
9. Ramgati.
10. Hatya.
11. Sandwip.

Feni

12. Pashuram.
13. Chhagahnaya.
14. Feni.
15. Sonagazi.

CHITTAGONG*Sadar*

1. Mirsarai.
2. Fatikchari.
3. Sitakund.
4. Hathazari.
5. Raojan.
6. Rangania.
7. Double Moorings.
8. Chittagong.
9. Pachalais.
10. Boalkhali.
11. Patiya.
12. Anwara.
13. Banskhali.
14. Satkania.

Cox's Bazar

15. Kutubdia.
16. Chakaria.
17. Maheskiali.
18. Cox's Bazar.
19. Ramu.
20. Ukhia.
21. Teknaf.

CHITTAGONG HILL TRACTS*Ramgarh*

1. Ramgarh.
2. Mahalchari.

Rangamati (Sadar)

3. Dighinala.
4. Barkai.
5. Langadu.
6. Rangamati.
7. Chandraghona.
8. Banderban.
9. Ruma.
10. Lana.
11. Nakhyongchari.

SYLHET*North Sylhet*

1. Gowainghat.
2. Jaintiapur.
3. Kanairghat.
3. (A) Karimganj (part).
4. Sylhet.
5. Biswanath.
6. Balaganj.
7. Golabganj.
8. Fenchuganj.

Karimganj

9. Beani Bazar.
10. Barlekha.

South Sylhet

11. Maulvibazar.
12. Srimangal.
13. Kamalganj.
14. Rajnagar.
15. Kulaura.

Sunamganj

16. Dharmapasha.
17. Tahirpur.
18. Sachna.
19. Sunamganj.
20. Chatak.
21. Dirai.
22. Jagannathpur.
23. Sulla.

Habiganj

24. Ajmiriganj.
25. Baniyachung.
26. Nabiganj.
27. Lakhai.
28. Habiganj.
29. Bahubal.
30. Madhabpur.
31. Chunarighat.

N.B. [Part of Balurghat thana (Dinajpur) included in East Bengal].

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